The Oil and Gas Journal

PUBLISHED WEEKLY BY THE
PETROLEUM PUBLISHING COMPANY,
211 S. Cheyenne
TULSA, OKLAHOMA

P. C. LAUINGER, *President* — *Editor*, C. O. WILLSON

S. H. ROURKE, *Business Manager* — LYNN M. NICHOLS, *Managing Editor*

M. L. DURHAM, *Circulation Manager* — W. T. ZIEGENHAIN, *Refinery Editor*

W. L. NELSON, *Technical Editor* — W. V. HOWARD, Ph.D., *Field Editor*

HARRY F. SIMONS
Production Engineering Editor

Associate Editors

H. STANLEY NORMAN — T. P. SANDERS

PAUL REED

District Editors

NEIL WILLIAMS — F. L. SINGLETON
Houston, *617 Caroline St.*

ROBERT INGRAM
Fort Worth, *Petroleum Bldg.*

CARL HOOT
Tulsa, *211 S. Cheyenne Ave.*

L. P. STOCKMAN
Los Angeles, *Union Oil Bldg.*

HENRY D. RALPH
Washington, *Natl. Press Bldg.*

O. C. PRESSPRICH
Saginaw, *News Bldg.*

TOLBERT R. INGRAM
Denver, *State Office Bldg.*

J. P. O'DONNELL
New York, *415 Lexington Ave.*

A. C. MacINTYRE
Oil City, *Derrick Bldg.*

VICTOR LAURISTON
Chatham, Ontario, *35 Stanley Ave.*

Advertising

E. KLAPPENBACH, *Vice President*

KENNETH J. LANGLEY
New York, *415 Lexington Ave.*

HOWARD MARKT
Cleveland, *Leader Bldg.*

C. R. FARMER
Chicago, *105 W. Madison*

MITCHELL TUCKER
Tulsa, *211 S. Cheyenne Ave.*

WAYNE RIVES
Houston, *617 Caroline St.*

J. HOWARD TINKHAM
Los Angeles, *1406 S. Grand Ave.*

A. J. CHAMBERS
Twickenham (Middlesex) England—*72 Cole Park Road*

Member
Audit Bureau of Circulations
Associated Business Papers

Table of Contents

Vol. 41, No. 5 — June 11, 1942

News Developments

Trends: Greater Shipments to Eastern States Necessary by Fall ... 13
Oil Development of Canadian Northwest to Be Accelerated ... *W. V. Howard* 14
Petroleum Industry War Council at Work ... *Henry D. Ralph* 16
OPC Warning Repeated That Supply Rules Will Tighten ... *Harry F. Simons* 20
This Week ... 21
News From the State Capitals ... 22
Editorial: Full Investigation Needed ... 23
Price Relief Granted the Oil Industry Is Relatively Minor ... *J. P. O'Donnell* 24
Protection of Coastal Waters May Decide Pipe-Line Issue ... 25
Rationing Decision Pending ... 25
Stimulation of Scrap-Rubber Collection Fits PIWC Plan ... 26
ODT Truck Rules Concern Oil Executives ... *Paul Reed* 27
Twenty-fifth Birthday Sees Phillips Still Expanding ... 28
Natural-Gas and Gasoline Division of OPC Organized ... 29
Natural-Gasoline News ... 31
Natural-Gas News ... 31
Recycling News ... 31
Programs and Meetings ... 32
Deaths ... 32
Condensed Directories of OPC, OPA and WPB ... 32
Refinery Activities ... 56
Who's Who in Refining ... 57
Pipe-Line Activity ... 61
Resistivity Method of Locating Oil and Gas Pays ... *J. L. Harper* 64
Amendment to Spacing Order Affects Few Illinois Fields ... *Herndon E. David* 66

Engineering—Operating

Drill-Pipe Inspection as Basis for Improving Drilling Technique ... *T. P. Sanders* 33
Flow of Homogeneous Fluids Through Radial Systems ... *Park J. Jones* 35
Pressure-Temperature Relations of Petroleum Fractions ... *W. L. Nelson and William Haltenberger, Jr.* 38
Factors Affecting the Volumetric Efficiency of Sucker-Rod Pumps ... *G. M. Stearns* 41
Operating Ideas ... 44
Refinery Ideas That Save $ $ $ ... 46
Questions on Technology ... *W. L. Nelson* 48
Co$t Engineering: Table of Equivalent Costs for Boiler Fuels ... 49
Engineering Fundamentals: Gas Flow in Series Lines ... 51
Journalog: Discovery Well, Unnamed Pool, Jack County, Texas ... 53

Field Developments

Field Developments ... 63
California ... *L. P. Stockman* 68
Permian Basin, Panhandle ... *Robert Ingram* 70
Michigan ... *Otto C. Pressprich* 72
Illinois ... 72
Rocky Mountain Area ... *T. R. Ingram* 73
Kansas, Nebraska ... *Carl Hoot* 74
Indiana, Ohio, Kentucky ... 75
Louisiana Gulf Coast ... *F. L. Singleton* 76
Texas Gulf Coast ... *F. L. Singleton* 77
Southwest Texas ... *F. L. Singleton* 78
Oklahoma ... *Carl Hoot* 79
North Central Texas ... *Robert Ingram* 80
Canada ... *Victor Lauriston* 81
North Louisiana-Arkansas ... 82
Eastern Texas ... *Robert Ingram* 83
Appalachian Fields ... 85
Among Drilling Contractors ... 86

Markets and Prices

Group 3 Market ... 90
New York Market ... 90
A.P.I. Refinery Report ... 90
Gulf Coast Market ... 90
Refinery and Tank-Wagon Prices ... 91
Crude-Oil Prices ... 91

Additional Features

Personal Paragraphs ... 88
Equipment News ... 92
Classified Advertising ... 94
Advertisers' Index ... 96

Published weekly by The Petroleum Publishing Co., 211 South Cheyenne, Tulsa, Okla. Subscription price, United States and foreign, 1 year, $6.00; 2 years, $10.00; 3 years, $12.00; 5 years, $15.00. Single copies, 20 cents each. Back copies, when over a year old, 50 cents. Changes of address reaching the Tulsa office of the Journal by Saturday take effect with the following issue. Entered as second-class mail matter at Tulsa, Okla., under the Act of March 3, 1879.

Copyright 1942, by The Petroleum Publishing Company.

To Cut Field Mileage
for PUMPING MAINTENANCE

Kobe Central Plant located near tank battery and controlling 11 wells on 20-acre spacing. Wells equipped with Kobe 2" Production Units set at approximately 4,000'.

Increasing shortages of experienced field personnel, automobiles and tires, together with the necessity of maintaining more and more pumping wells, make the advantages of Kobe Multiple Pumping strikingly apparent.

The centralized control of the Kobe System can save operating personnel many miles every day. Operating plants, regardless of 10 or 40 acre spacing, usually are located within a few hundred feet of the tank battery, and field work in general can be confined to this one point. For here are located all the power units, engines, and well controls for any given operation, whether of two or twenty wells. Individual well gauges and control valves are operated at the central manifold. Pumping conditions in any well can be quickly determined from these gauges; and pump speeds altered to meet any condition by the simple adjustment of a metering valve; both at this one central point.

The amount of maintenance per well also is greatly reduced by Kobe pumping. The consolidation of horsepower requirements at one place effects a large reduction in the number of engines, greatly simplifying lubrication, fuel and repair activities; while the absence of moving parts at the well does away with much mechanical maintenance work, and well locations need only be visited for periodic inspections or infrequent well repairs.

It is generally predicted that more oil will be needed from more pumping wells very soon. It's wise, therefore, to plan now for tomorrow's equipment needs and operating conditions. The Kobe Technical Service Department will gladly help adapt the many advantages of Kobe pumping to your leases. A note to this department today, or a call to your nearest Kobe representative will bring prompt action.

K O B E , I N C O R P O R A T E D
(Pronounced KO-BE) HUNTINGTON PARK, CALIFORNIA

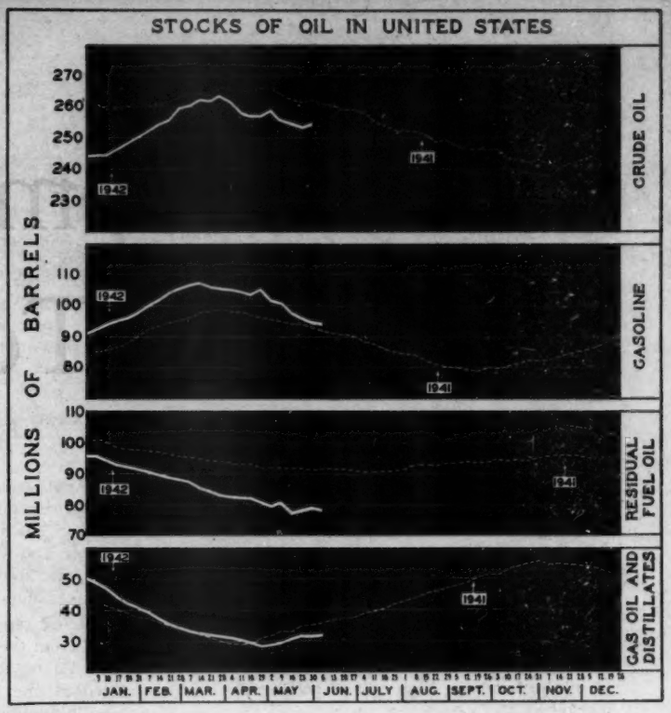
Mid-Continent Office and Shop: Oklahoma City, Okla. Export Office: 30 Rockefeller Plaza, New York, N. Y.
District Offices: Tulsa and Maud, Okla. Houston, Dallas, Odessa, Ranger, Tyler and Wichita Falls, Texas
Great Bend, Kansas Mt. Vernon, Illinois

KOBE

HYDRAULIC PUMPING SYSTEMS

Trends

Greater Shipments To Eastern States Necessary By Fall



INDICATIONS that restrictions in the use of petroleum will not be expanded to additional areas in the immediate future have resulted in new studies as to the probable trends in production and consumption through the summer months and later in the year. Gasoline rationing in the Middle West and Southwest comparable to that now in effect in the Atlantic seaboard states, would mean major changes in refinery operations with reactions which would include pipe-line and producing operations. Refinery operations, at this time, in areas not directly affected by eastern marketing conditions appear to be in fair balance. The 20 per cent reduction in gasoline yields has not brought a general curtailment in crude runs to stills, the increase in demands for products other than gasoline offsetting the loss in gasoline gallonage. Demand for all petroleum products used in the rural areas of the Middle West and Southwest is particularly strong. Increased runs to stills in the Mid-Continent are in prospect for the remainder of this month.

CRUDE PRODUCTION *3,623,530 bbl. daily average—down 280,270 bbl. One year ago 3,800,475 bbl.*

CRUDE STOCKS *255,023,000 bbl. as of May 30—up 1,600,000 bbl. One year ago 262,356,000 bbl.*

GASOLINE STOCKS *93,305,000 bbl. as of June 6—down 2,050,000 bbl. One year ago 91,890,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *79,556,000 bbl. as of June 6—down 72,000 bbl. One year ago 91,961,000 bbl.*

GAS OIL AND DISTILLATES *31,535,000 bbl. as of June 6—up 151,000 bbl. One year ago 36,206,000 bbl.*

REFINERY RUNS *3,451,000 bbl. daily week ended June 6—down 71,000 bbl. One year ago 3,909,000 bbl.*

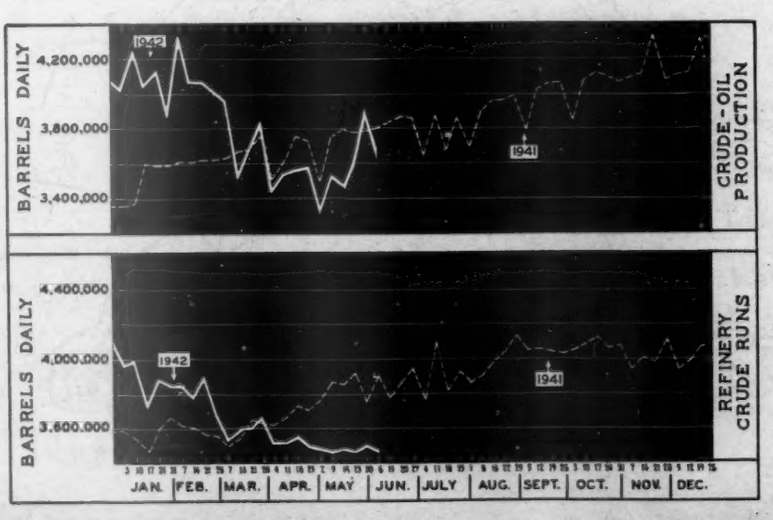
In the Gulf Coast and in the eastern states considerable thought is being given as to how petroleum shipments from sources of supply can be increased. Right now the supply and minimum demands in the 17 eastern states and the District of Columbia are about in balance. This balance will be maintained through the third quarter if certain small pipe-line projects are completed. This plan, however, does not provide for the accumulation of eastern storage over the next 4 months. It is not generally realized that petroleum needs in the eastern states are substantially greater during the fall and winter months than they are during spring and summer.

DAILY AVERAGE PRODUCTION FOR WEEK

	June 6, 1942 Crude oil	June OPC recommended production All oils	May 30, 1942 Crude oil
Arkansas	73,200	75,300	72,750
California	602,250	691,900	587,750
Colorado	7,065	7,600	7,600
Eastern fields	122,300	125,700	120,100
Illinois	293,765	320,800	287,290
Kansas	218,300	281,900	256,500
Louisiana	302,900	311,300	294,700
North Louisiana	*87,150*	.....	*86,550*
Louisiana Gulf Coast	*215,750*	.....	*208,150*
Michigan	65,500	63,100	64,400
Mississippi	84,230	49,200	82,000
Montana	22,700	23,400	21,720
Nebraska	3,950	4,100	4,000
New Mexico	74,720	80,600	74,370
Oklahoma	380,200	436,600	383,250
Texas	1,275,550	1,068,600	1,549,800
East Texas	*368,650*	.....	*495,000*
West Texas	*207,100*	.....	*210,000*
North Central Texas	*149,500*	.....	*155,950*
East Central Texas	*78,600*	.....	*100,050*
Texas Panhandle	*87,000*	.....	*98,000*
Texas Gulf Coast	*326,650*	.....	*426,050*
Southwest Texas	*58,050*	.....	*64,750*
Wyoming	96,900	96,200	97,370
Total United States	3,623,530	3,636,300	3,903,800
Total production, Jan. 1-June 6, 1942	*597,862,575 bbl.		
Same period last year	546,677,800 bbl.		

*Corrected.

PIWC's Committee on Petroleum Economics stressed this situation last week, pointing out that while total essential demands were 1,073,000 bbl. daily in June they will be 1,373,000 bbl. daily the last quarter of this year, and 1,466,000 bbl. daily the first quarter of 1943. This committee states that the minimum demands between now and April 1, 1943, will be 178,000 bbl. daily more than the foreseeable nontanker shipments. Additions to this shortage will materialize should relief be given to severe rationing now effective in the eastern and southeastern part of the United States. It is estimated that tanker shipments from the Gulf Coast of approximately 350,000 bbl. daily will be necessary over the remainder of the year if a more reasonable program in restriction of eastern consumption is made effective as is now being discussed in Washington.



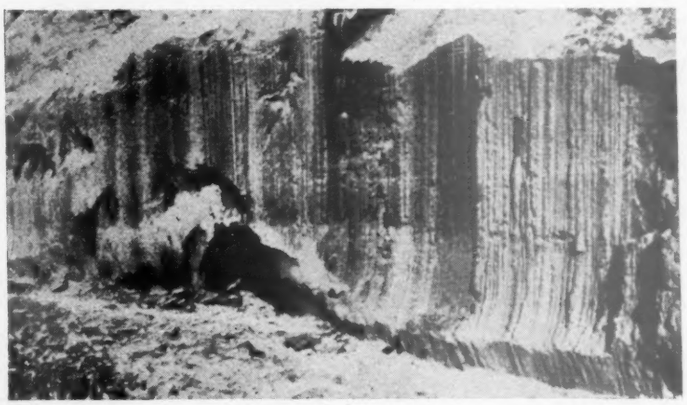
Oil Development of Canadian Northwest To Be Accelerated

By W. V. HOWARD

THE existence of oil in enormous quantities and the presence of large potentially petroliferous provinces in Alaska and the Canadian Northwest have been known for many years. The outstanding known occurrence, the Tar sands of the Athabaska River were seen and reported by white men in 1778. At that time, pitch from thsee sands was used in waterproofing canoes and dugouts. However, their economic exploitation has been retarded owing to the high cost of transportation of equipment into the area, the high cost of mining, and the high cost of getting the oil to market.

Actually commercial development of the oil deposits north of Edmonton began some 50 miles north of Fort Norman, almost on the Arctic Circle. The first well was drilled in 1919 and precipitated a promotional boom. The remoteness of the field added to the enchantment of the picture and blinded the speculating public to the high cost of development and the lack of a market. After the excitement died down, Imperial Oil, Ltd., went back into the area and continued development on a scale proportionate to the local demand for oil. The first well, which produced 100 bbl. initially at 783 ft. in 1920, was deepened to 951 ft. in 1922 making 60-70 bbl. In 1923 it was again deepened to 1,025 ft. where it increased to 100 bbl. After two dry holes were drilled and a small gas well was completed 8 miles up the river, a second well was drilled 150 ft. from No. 1. This made 110 bbl. from 936-1,063 ft. The pay horizon is in the Fort Creek shales in the Upper Devonian. A third well was completed later and the combined potential of the three wells is reported to be about 400 bbl.

There was a small local market for gasoline, kerosene, lubricating and fuel oil, and a small refinery was built to supply this market. When the radium deposits were found on Great Bear Lake the demand increased and with the rapid growth of air freight, it was necessary to enlarge the refinery. It produces an 80-octane gasoline after addition of lead and this can be stepped up to 87 octane. The capacity of the refinery is at present about 400 bbl. and it is run only in the summer months.



Bituminous sand exposure, Horse River, McMurray, northern Alberta

It is not at all definitely established that the Fort Norman oil field is on the best structure in the area. The original wells were drilled along the river and small-scale structure maps of the area do not show the field on any of the 12 anticlinal axes important enough to map.[1]

There are reports that a pipe line is being considered from the Fort Norman area to Whitehorse on the Yukon River and that a refinery may be erected at the latter point. A highway extends from Whitehorse to Dawson and the Yukon River is navigable from Whitehorse down. There is a regular steamer schedule during the summer months from Whitehorse to Nenana on the Alaska Railway near Fairbanks.

Proceeding upstream from Fort Norman, we find mention in the Geological Survey of Canada reports of seeps on the tributaries of the Mackenzie River and on Great Slave Lake. Gas was reported in wells drilled near Pelican on the Athabaska River above McMurray. Oil shows and gas were found in wells near Peace River and a 10,000,000-cu. ft. gas well is reported near Pouce Coupe, south of the Peace River near the British Columbia border. A well near Lesser Slave Lake was reported as making 7,000,000 cu. ft. of gas at 1,855 ft. with shows of oil between 1,862 and 1,960 ft.

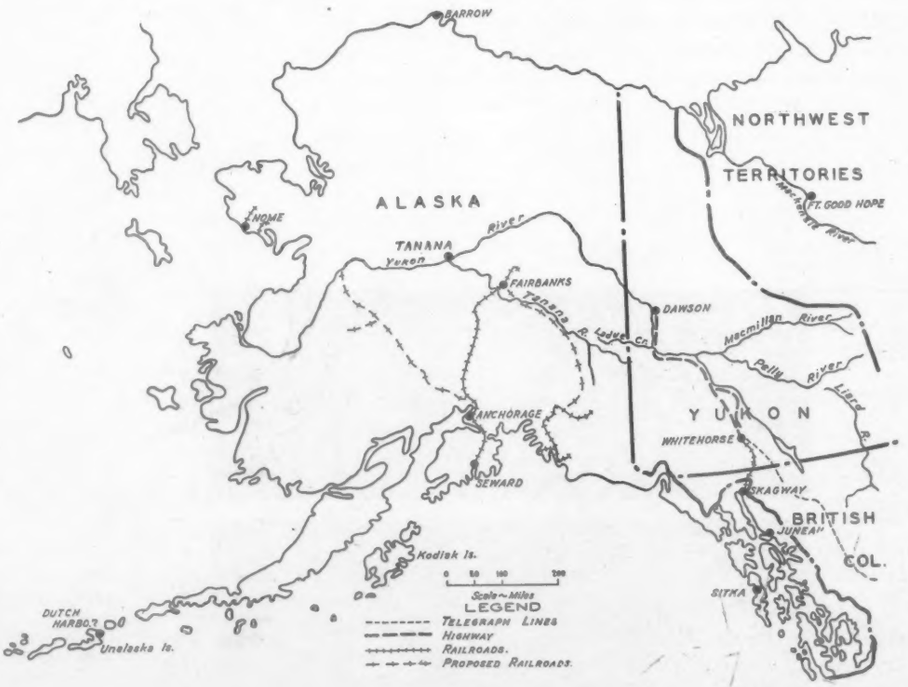
Although detailed information is not available, commercial oil wells which have not been put on production are reported from the Peace River area close to the Alberta-British Columbia border.

The Peace River district is accessible by rail and highway from Edmonton and a road has been built from the end of the railroad through Fort St. John to Hudson Hope. Above the point where it cuts through the Rocky Mountains the Peace River and its tributaries drain a large area in northern British Columbia. By following the old canoe trade routes a pipe line could be constructed from the British Columbia-Alberta border to the headwaters of the Skeena and thence to Prince Rupert on the Pacific Ocean.

1. A.A.P.G. Bulletin, Vol. 25, No. 8, Aug. 1941, pp. 1,147-56.

Athabaska Tar Sands

The area underlain by the Lower Cretaceous tar sands of the Athabaska region occupies some 20,000 to 30,000 sq. miles and the sands are estimated to contain between 100,000,000,000 and 250,000,000,000 bbl. of oil. The great bulk of this deposit is covered by overburden and mining is necessary at a cost which is prohibitive under present conditions. However, from a short distance above McMurray for more than 60 miles downstream and up many tributaries, the rivers have carved out deep valleys which have cut through the tar sands, leaving them exposed. In the area of 10 to 20 sq. miles which can be mined under existing conditions, there is an estimated available reserve of from 500,000,000 to 1,000,000,000 bbl. of oil.



Following many years of research by the federal and provincial governments, International Bitumen Co. started operations in 1922 at Bitumont, 55 miles down the river from McMurray. The plant is not now in operation but it is credited with the first commercial production of refined products. It shipped fuel oil to Goldfields in the north and asphalt as far south as Indiana.

In 1930, Abasand Oils, Ltd., was formed. After 6 years of laboratory and pilot-plant operation in Denver, Kansas City, and Toronto it constructed a small commercial plant on Horse River, a tributary of the Athabaska 2½ miles above McMurray. In May 1941, the company started operation and continued until late November when fire destroyed half of the plant. It is being rebuilt.

During its 6 months of operation, the company produced gasoline, diesel fuel, fuel oil, and coke. It did not manufacture any road oil or asphalt as the demand for the other products was too great to permit it.

The average yield from the old plant was 175 bbl. of oil from 250 tons of sand and the estimated capacity of the plant was 400 tons daily.

In rebuilding, advantage is being taken of the experience gained during the 6 months of operation, and a few changes in equipment and method are being made, though none in fundamental processes. The method of operation as here described embodies these changes.

The sand body being mined is about 35 ft. thick, and was originally covered by an average of about 12 ft. of clay, sand, and gravel. This overburden is stripped off by steam shovel and trucks or by carry-all scrapers. The oil sand is then shattered in place with dynamite, and picked up by steam shovel, and loaded into carry-alls hauled by tractors. These take it to the separation plant.

The separation of the oil from the sand requires three processes. First the oil, which is a clinging film enveloping each grain of sand, is broken loose by being tumbled about in hot water. The result is a pulp of sand and water and scattered particles of oil. The process is so conducted that the pulp also contains a multitude of particles of air. The pulp then goes to specially designed flotation cells where the oil, which is as heavy as water and therefore will not float of its own accord, forms bubbles with the air particles and floats to the surface as a froth. The froth contains considerable quantities of water and sand, far too much to be allowed to reach the refinery. It is accordingly mixed or diluted with naphtha, which makes the oil so light that the sand and water quickly settle out. The diluted oil then goes to the refinery, where the naphtha is recovered and returned to the separation plant to be used again.

The first step in refining the oil is to digest it by heating it for half an hour or so in a "soaking" chamber. The rest of the refining is done by conventional methods in a pipe still and a battery of shell units, with the usual complement of bubble tower, clay tower, gas traps, condensers and coolers, and the like.

The liquid products go to the railroad or the steamboat wharves through a pipe line; the solid products go by truck.

The rebuilt plant will have a capacity of about 600 tons a day, from which about 525 bbl. of oil will be recovered. This output will be adequate to supply the gasoline, diesel, and fuel-oil requirements of the North and most of the highway-asphalt requirements of the northern half of Alberta. The main purpose of the plant, however, is to serve as a guide to a much larger operation that the company has in mind, to produce some 10,000 bbl. of digested crude a day on the Athabaska, ship it to Edmonton, and there convert it into refined products to help meet the need for an increased supply of petroleum products on the prairies.

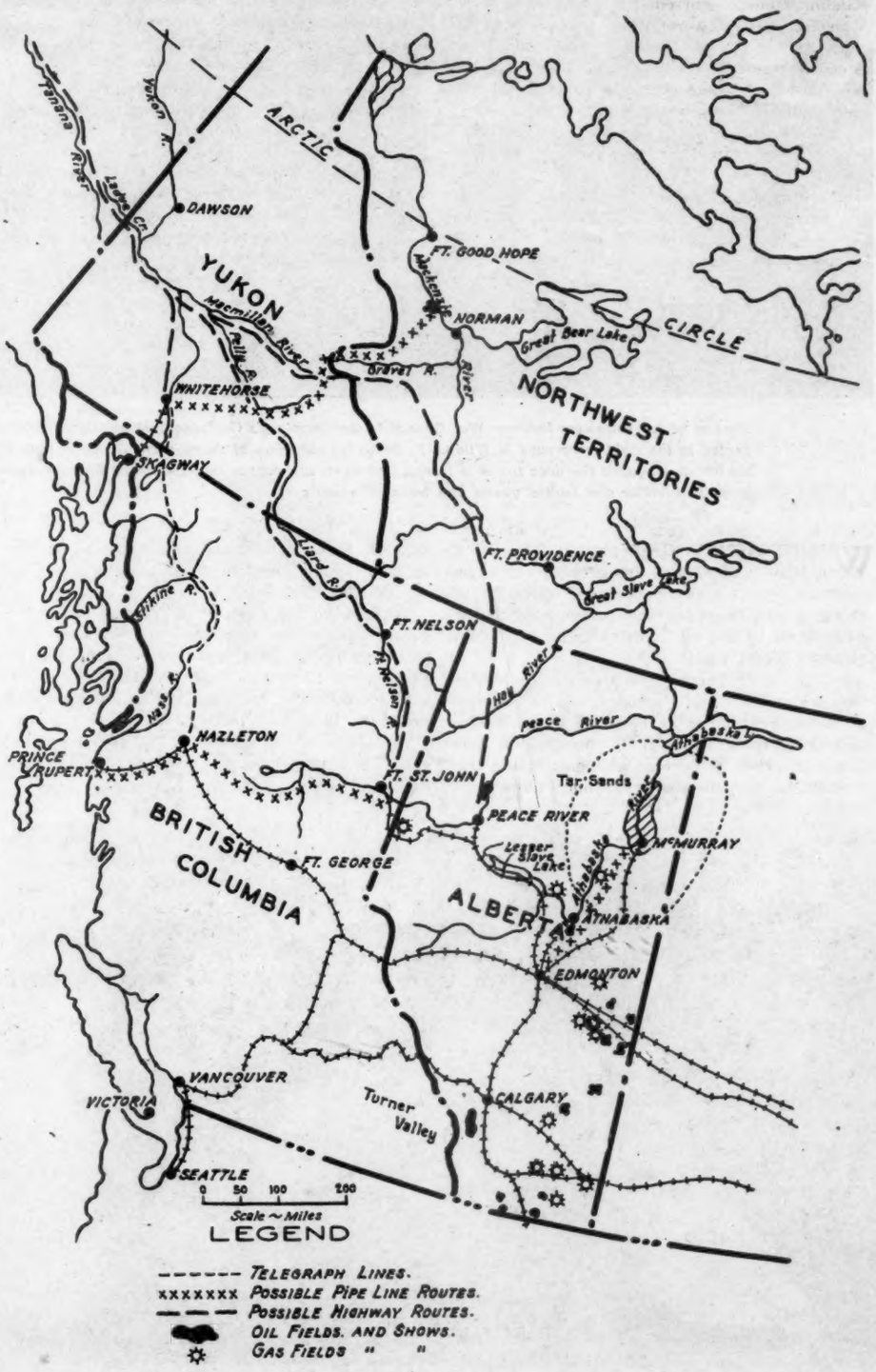
The oil, as it occurs in the sand, is a black asphaltic material too viscous to flow at ordinary temperatures. It is extremely susceptible to heat and as a result of mild digestion, its gravity is raised from 10° to 20-22° which makes it easy to handle. The yields of the various products depend upon seasonal markets. If desired, the topping plant can recover from the digested crude up to 28-30 per cent of 66-octane gasoline without the addition of lead. During certain periods, over 60 per cent of light and heavy diesel fuels can be made whose pour point is below the extreme winter temperatures of the North.

The crude is stated to be the purest form of asphaltic crude known and is capable of yielding products of high quality, particularly with respect to ductility-melting point and ductility-penetration ratios. The operators believe that the crude can be cracked catalytically for the manufacture of 100-octane fuel and that buna-S synthetic rubber can be produced by cracking and alkylation. They can make, if desired TNT and ammonium nitrate as well as other compounds valuable in the chemical industry.

Recently a committee representing the largest mining and transportation interests in Canada have inspected the property and this week it is reported that a pipe line, probably to Edmonton is under consideration.

With Japanese raiders appearing at Dutch Harbor and the possibility of direct attack of Japan

(Continued on Page 30)



Petroleum Industry War Council

Meeting of the Petroleum Industry War Council in the Secretary's Conference Room, Department of the Interior, Washington, D. C., June 2, 1942. Seated in the right foreground is William R. Boyd, Jr., chairman of the council. At his right is Allan H. Hand, secretary-treasurer; standing with his left arm against the door frame is Joseph L. Dwyer, assistant to the chairman. Also present are members of the staff of the Office of Petroleum Coordinator and invited guests and technical experts

WASHINGTON, D. C.—A pattern for getting a large and diverse industry to work together as a unit under government direction to achieve a specific object such as winning a war is furnished by the oil industry in its Petroleum Industry War Council.

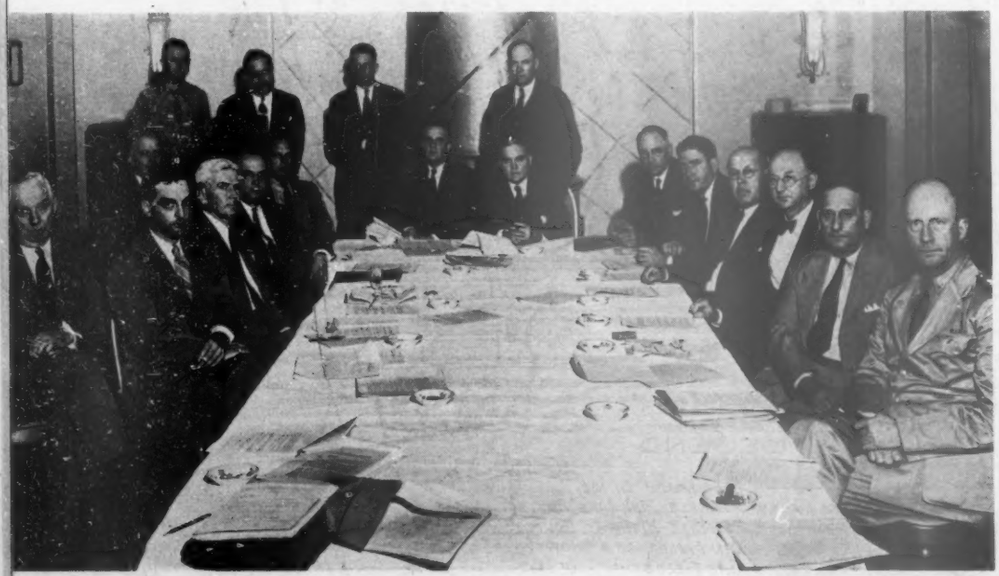
On the first Tuesday of every month the "best brains of the oil industry," 72 representative executives, gather in the Office of the Petroleum Coordinator for War in Washington and discuss in detail all current problems facing the oil business. But these men do much more than discuss; they advise and make recommendations to government regulatory agencies and to the oil industry itself.

Technically, the work of the council ends with giving advice—and sometimes the members feel that the advice ends with the council—but in practice the council in recent months has become the supreme policy-making body, almost a governing body, of the oil industry.

The secret of the success of the Petroleum Industry War Council is that it doesn't "go off half cocked," doesn't come to Washington once a month just to blow off steam and complain about burdensome government regulations. It does blow off plenty of steam on occasion, and it does complain about government actions, but it comes to Washington armed with carefully prepared facts and reports worked up by its standing and special committees. In fact, it is in the committees that the bulk of the work of PIWC is done.

The June meeting, for example, lasted 3 full days, and most of the time was devoted to discussion of committee reports. All of the committees met on Monday; several met repeatedly throughout the week, even on Saturday afternoon though the council had adjourned on Thursday; and a number of the committees had been working on their assignments almost continuously during the preceding month.

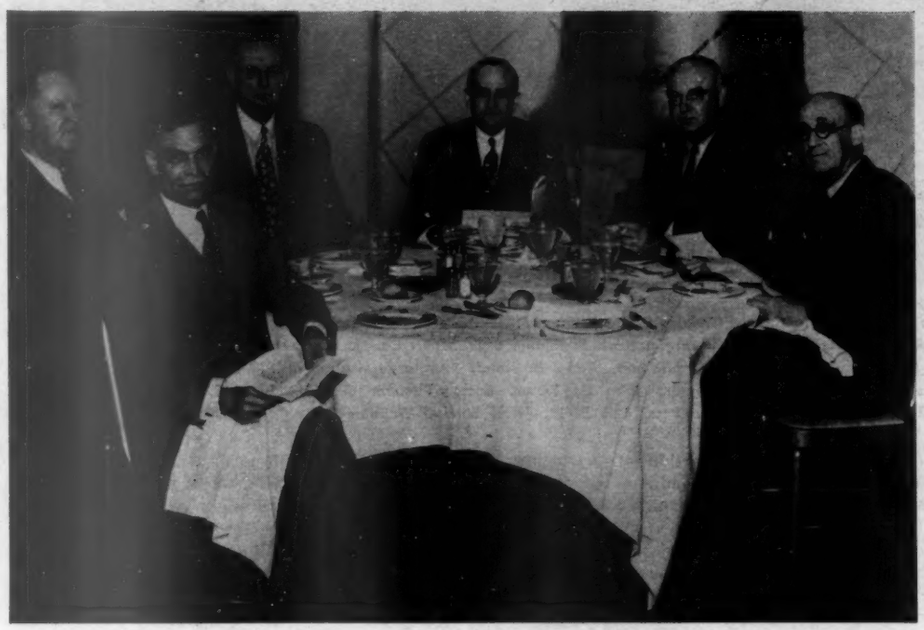
The committees themselves are composed only of council members, but most of them have tech-



Committee on facilities protection of the PIWC. Reading clockwise the men seated are: H. D. Collier, Standard Oil Co. of California; R. H. Cunningham, U. S. Government adviser on plant protection; C. V. Broadly, U. S. Government adviser on plant protection; Col. J. Frank Drake, Gulf Oil Corp.; W. D. Mason, OPC director of facilities protection; Philip Bastedo, U. S. Government adviser on plant protection; D. V. Stroop, committee secretary; George A. Hill, Jr., chairman pro tempore; J. Howard Pew, Sun Oil Co.; Eugene Holman, Standard Oil Co. of New Jersey; W. G. Skelly, Skelly Oil Co.; C. L. Henderson, Western Petroleum Refiners Association; John R. Day, Western Petroleum Refiners Association, and Admiral J. V. Parker, U. S. Coast Guard. Standing are: Maj. Frank R. Wilder, U. S. Army; N. C. McGowen, United Natural Gas Co.; Frank Campbell, Texas Co.; and J. C. Hunter, Mid-Continent Oil and Gas Association

AT WORK—

By HENRY D. RALPH



Here is the story of the Petroleum Industry War Council based largely on its June meeting as typical of how it is functioning during the emergency in the interests of the nation and the industry which it represents. The 72 operating executives representing all branches of the petroleum industry which comprise the council, give freely of their time, working in harmony with the Office of Petroleum Coordinator and other war agencies. As explained here, the group meets once a month, but its work does not end with these monthly meetings. Committees work diligently between meetings to organize, investigate, sift facts, and plan discussions. Numerous subcommittees, drawing on the best-informed technicians and economists of the industry, lend heroic assistance.

Committee on cost and price adjustment: John D. Gill, Atlantic Refining Co., chairman; William F. Humphrey, Tide Water Associated Oil Co.; John A. Brown, Socony-Vacuum Oil Co., Inc.; William R. Boyd, American Petroleum Institute; Charles F. Roeser, Roeser & Pendleton., and Frank Phillips, Phillips Petroleum Co.

nical subcommittees composed of employes of large and small oil companies who are experts in their fields. And a few of the committees, notably that on petroleum economics, have full-time paid staffs functioning in New York. Furthermore, the committees work closely with the various divisions of the Office of Petroleum Coordinator in interchanging data and preparing their reports for the council. Thus the PIWC is no mere junket to Washington; it is a serious, hard-working group with the current facts and problems of the industry at its finger tips.

Through a coincidence, the council held its first meeting on December 8, 1941, the day after Pearl Harbor, and while President Roosevelt was delivering his war message to Congress the council was organizing to mobilize the oil industry for war. Six months earlier the president had appointed Harold L. Ickes, secretary of the interior, as petroleum coordinator for national defense, and the coordinator's staff was already functioning actively. It had several divisions staffed with men on the government pay roll but largely drawn from the oil industry itself. It also had five regions throughout the country, and in each region were five functional committees and a general committee, all composed of men in various branches of the oil and gas industries.

But Coordinator Ickes felt the need for an over-all body representing the entire industry to advise him on national problems and to correlate work of the regional industry committees. Hence the council, which, by force of circumstances, immediately became the Petroleum Industry War Council.

More than half of the 72 members of the PIWC hold membership ex officio, and all but 14 were appointed by Mr. Ickes, directly or indirectly, but on nomination by the industry. The nucleus of the council is the 30 chairmen of the regional industry committees of the Office of Petroleum Coordinator, the heads of the five district general, production, refining, transportation, marketing, and natural gas and natural gasoline committees. To these were added the presidents of 14 trade associations in the oil and gas industry. The rest of the 72 are outstanding executives of large and small companies who, for various reasons, were not members of the district OPC committees.

So composed, the PIWC is a true cross-section of the oil industry, and its members, assisted by technicians drawn from many companies, can well be said to constitute the "best brains of the oil industry."

Though appointed by a government official and operating under government sanction, the PIWC is not a governmental agency. It finances itself from voluntary contributions of oil companies and trade associations. Its only powers are to

PIWC marketing committee: Roy B. Jones, Panhandle Producing & Refining Co.; R. E. Decker, Plymouth Oil Co.; H. Earl Clack, Clack Oil Co.; Miss Mary McLeod, PIWC secretarial staff; Russell Williams, District 2 marketing committee of OPC; Dr. John W. Frey, OPC director of marketing; Dr. Joel Dean, chief, fuel rationing branch, OPA; Bernard J. Majewski, Deep Rock Oil Corp., chairman; John Neukom, fuel rationing branch, OPA; N. H. Weber, National Petroleum Association; A. A. Stambaugh, District 2 marketing committee, OPC, and Eric V. Weber, Ohio Petroleum Marketers Association

PIWC synthetic rubber committee: Jacob France, Mid-Continent Petroleum Corp.; William F. Humphrey, Tide Water Associated Oil Co.; Joseph E. Pogue, Chase National Bank; Dr. Robert E. Wilson, Pan American Petroleum & Transport Co.; J. H. Pipkin; Wright W. Gary, director of refining, OPC; W. S. S. Rodgers, Texas Co., chairman; Allan H. Hand, secretary-treasurer of PIWC; Frank Phillips, Phillips Petroleum Co.; Charles F. Roeser, Roeser & Pendleton; John A. Brown, Socony-Vacuum Oil Co., Inc.; R. van der Woude, Shell Union Oil Co.; Dr. Alexander Sachs, Lehman Brothers, and E. W. Isom, Sinclair Refining Co.

make recommendations to the Government and carry out instructions from the Government. This is made clear in the document under which it exists, Recommendation No. 24 of the Office of Petroleum Coordinator, issued December 11, 1941.

The chairman and chief executive officer of the council is William R. Boyd, Jr., president of the American Petroleum Institute. Mr. Boyd spends virtually all his time in the Washington headquarters offices of the council, temporarily housed in the Shoreham Hotel but soon to move to the Commonwealth Building at Seventeenth and K streets in the business section of the city.

Full and Part-Time Assistants

Also in the headquarters offices as full-time executives are Joseph L. Dwyer, assistant to the chairman, and Allan H. Hand, secretary-treasurer of the council. Mr. Dwyer is "loaned" by the A.P.I., where he is assistant to the president. Mr. Hand has a background of some 30 years in the oil business, much of it with Union Oil Co. of California, and before taking this post he was connected with the Office of Price Administration and later was assistant director of transportation in the Office of Petroleum Coordinator.

In addition, there are two part-time assistants to the chairman: Russell B. Brown, general counsel of the Independent Petroleum Association of America, and Fayette B. Dow, general counsel of the National Petroleum Association and the Western Petroleum Refiners Association. Both of these have long maintained offices in Washington and are constantly available for advice and assistance.

Originally it was intended that an executive committee of 25 members would do much of the work of the council, particularly in preparing for the monthly meetings. However, experience soon showed that much more could be accomplished through a series of standing committees devoting their attention to particular subjects. At the first few meetings the agenda were prepared by the executive committee the day before the council meeting, but now the program is arranged some days in advance by the headquarters staff, based on scheduled committee reports. The chief function of the executive committee now is to meet on call of the chairman in case anything requiring action should arise between monthly meetings of the full council.

The important standing committees of the council are those on production, natural gas and gasoline, refining, transportation, marketing, petroleum economics, protection of petroleum industry facilities, and cost and price adjustment. Many of these committees have numerous subcommittees, notably the marketing committee, to deal with special problems, and these subcommittees are composed of men in the industry not members of the council. Only the full committees composed of council members have authority to act on recommendations and function officially as outlined in the formal recommendation of OPC creating the council, but the subcommittees do much of the "spade work." Most of the committee meetings are open to other representatives of the industry, but while these observers may participate in discussions they cannot vote nor have a voice in final actions, since only the council members appointed by Coordinator Ickes have the authority and responsibility for decisions of the council and its committees.

From time to time special and temporary committees are appointed, the most important ones at the present being those on synthetic rubber and on pipe-line management.

Before the committee system got to functioning the council threatened to degenerate into an aimless debating society. The members assembled without a definite program before them and discussion roamed all over the lot, much of it being devoted to complaints that government actions threatened to disrupt the oil industry and that industry advice was neither asked nor taken.

A showdown came at the February meeting. With Coordinator Ickes and members of his OPC staff present, the council "took down its hair" about its troubles and had a heart-to-heart talk. There were some tense moments, but when it was all over everyone felt that a lot of good had been done and that there was a much better understanding all around. Fields of jurisdiction and lines of action were mapped out, and from then on the council began to gain in importance and influence.

Jurisdiction of the Council

Now there is close cooperation between the council, the OPC staff and the OPC industry district committees. As to jurisdiction, the council deals with national problems of the industry, while the district committees handle problems affecting their own regions, frequently working together on matters affecting adjoining districts. The carrying out of policies once determined is the function of the OPC itself, making use of the district committees through formal recommendations and directives.

That, at least, is the theory and the agreed procedure, but in practice things tend to get a little mixed up. So many regional problems of the industry have national aspects that virtually everything is appropriate for discussion and resolution by the council and its committees. Also, the coordinator frequently calls on the council to perform a special task which takes it out of the advisory field and makes it a functional or operating body.

An example of this is the job of pipe-line relocation. Special committees of the council surveyed the entire industry, located unused pipe lines and pumping equipment, and mapped out routes and operating plans for relaying old lines so as to get some 200,000 bbl. of oil a day moving toward the East Coast shortage area. Some of these projects were started immediately by the companies concerned. After the council approved the committee's report and submitted it to the coordinator, the OPC issued a formal recommendation calling on the industry to carry out these re-laying projects, but the PIWC pipe-line committee continues to supervise the program.

Meetings Last 2 or 3 Days

Originally conceived as a 1-day-a-month institution, the council meetings now last 2 or 3 days and committees are in session whenever they can find places in the schedule during a week or 10 days around council meeting time. Many of the committees are working constantly between council meetings and develop voluminous reports to be digested before presentation. Much of this work requires close cooperation with staff officials of the OPC. The committee on petroleum economics, for instance, is constantly exchanging information with the OPC Division of Research and Statistics so that both are kept currently informed on the supply-and-demand situation. The importance attached to council meetings by the OPC is shown by the way in which OPC staff men prepare for them. For several days around meeting time they are in frequent conference with committee members assisting in drawing up reports and furnishing information as requested.

As a result of the preliminary work of the committees, the council office staff, and the OPC

divisions, the meetings proper proceed with unusual expedition for a body of its size and makeup. When Chairman Boyd calls the meeting to order in the secretary's conference room in the Interior Department Building, he knows what subjects are to be brought up and who will open the discussion on each. Frequently, of course, some subject will provoke much longer discussion than anticipated but in general the meetings move from one matter to another with great dispatch because the committee reports have boiled down the various topics to their essentials.

Always present at parts of the council meetings are experts and observers from several oil companies, OPC staff men, specially invited guests, and representatives of other government agencies dealing with matters under discussion, such as the OPA and WPB. These government men are often invited to speak to the council in addition to conferring with the committees in the precouncil and postcouncil sessions. But at other times the nonmembers are excluded and the council itself gets down to purely "family affairs." None of the council meetings are open to the public, but after each session the secretary usually releases summaries of the discussion, or copies of committee reports and resolutions of the council when authorized to do so.

Program of Typical Meeting

A typical meeting opens with a request to the petroleum coordinator to present any message or request he may have. Then follow reports from the standing committees, with discussion of each and adoption of any resolutions which may be called for. Frequently a committee is asked to revise a report or obtain supplemental data and report back before the session adjourns. Special committee reports and new business is next in order, and during virtually every meeting time is set aside to hear a brief address by a specially invited representative of a government agency other than the OPC. Finally the chairmen of the district general committees and the directors of the OPC divisions make brief reports on their activities and problems.

Considering that the council has power to do nothing except advise and recommend, it has done a remarkable job in getting the oil industry to function more or less as a unit in finding solutions to the many pressing problems growing out of the war. This may be attributed to the fact that the makeup of the council and the operations of its committees afford every branch of this widespread and diverse industry an opportunity to have its say on any subject. Naturally, every view does not prevail and sometimes the unanimous opinion of the entire industry is disregarded by a government agency for reasons of administration policy or war necessity. But the fact that every element in the industry has had a chance to speak its piece and get its views considered is in itself a great aid to voluntary cooperation in programs which are considered necessary for the war effort.

Coordinator Ickes has called the council procedure a partnership between Government and industry, designed to make possible the accomplishment of things which neither could do alone. To judge from the council's present functioning, this administrative form was a happy solution to such an objective, and one which might well be envied by other industries faced with the problem of meeting government demands forced by the exigencies of the war.

Members of Council

Following are the members of the council and the present composition of its standing and special committees:

W. R. Boyd, Jr., chairman of council, president, American Petroleum Institute, New York; T. H. Barton, president, Lion Oil & Refining Co., El Dorado, Ark.; Burt R. Bay, chairman, natural gas and natural gasoline committee, District 2, president, Northern Natural Gas Co., Omaha, Neb.; C. S. Beesemyer, chairman, marketing committee, District 5, vice president, Gilmore Oil Co., Los Angeles, Calif.; Sidney Belither, executive vice president, Shell Oil Co., Inc., San Francisco, Calif.; M. L. Benedum, president, Benedum-Trees Oil Co., Pittsburgh, Pa.; Paul G. Blazer, chairman, refining committee, District 2, president, Ashland Oil & Refining Co., Ashland, Ky.; J. S. Bridwell, president, Bridwell Oil & Gas Co., Wichita Falls, Tex.; John A. Brown, chairman, general committee, District 1, president, Socony-Vacuum Oil Co., Inc., New York; Frank Buttram, president, Independent Petroleum Association of America, Oklahoma City, Okla.

J. W. Carnes, chairman, marketing committee, District 1, vice president, Sinclair Refining Co., New York; H. Earl Clack, chairman, marketing committee, District 4, president, Clack Oil Co., Havre, Mont.; Robert H. Colley, chairman, refining committee, District 1, president, Atlantic Refining Co., Philadelphia, Pa.; H. D. Collier, president, Standard Oil Co. of California, San Francisco, Calif.; Howard A. Cowden, president, Consumers Cooperative Association, North Kansas City, Mo.; Henry M. Dawes, president, Pure Oil Co., Chicago, Ill.; Sylvester Dayson, president, Premier Oil Refining Co., Longview, Tex.; R. E. Decker, president, National Oil Marketers Association, Detroit, Mich.; B. E. Devere, president, Independent Refiners Association, Los Angeles, Calif.; O. D. Donnell, chairman, production committee, District 2, president, Ohio Oil Co., Findlay, Ohio; J. Frank Drake, president, Gulf Oil Corp., Pittsburgh, Pa.

William S. Farish, president, Standard Oil Co. (New Jersey), New York; W. H. Ferguson, chairman, general committee, District 4, executive vice president, Continental Oil Co., Denver, Colo.; Jacob France, president, Mid-Continent Petroleum Corp., Tulsa; B. I. Graves, vice president, Tide Water Associated Oil Co., New York; Walter S. Hallanan, chairman, production committee, District 1, president, Plymouth Oil Co., Pittsburgh, Pa.; D. P. Hamilton, president, Root Petroleum Co., Shreveport, La.; Jake L. Hamon, president, Cox & Hamon, Inc., Dallas, Tex.

Robert W. Hendee, chairman, natural gas and natural gasoline committee, District 4, general manager, Colorado-Interstate Gas Co., Colorado Springs, Colo.; C. L. Henderson, president, Western Petroleum Refiners Association, Tulsa; George A. Hill, Jr., chairman, production committee, District 3, president, Houston Oil Co. of Texas, Houston, Tex.; Dana Hogan, president, Hogan Petroleum Co., Los Angeles, Calif.; W. T. Holliday, president, Standard Oil Co. (Ohio), Cleveland, Ohio; D. W. Hovey, president, Gulf Coast Refiners Association, Houston, Tex.; William F. Humphrey, president, Tide Water Associated Oil Co., San Francisco, Calif.; J. C. Hunter, president, Mid-Continent Oil & Gas Association, Tulsa.

A. Jacobsen, president, Amerada Petroleum Corp., New York; Charles S. Jones, chairman, transportation committee, District 5, president, Richfield Oil Corp., Los Angeles, Calif.; Roy B. Jones, chairman, marketing committee, District 3, president, Panhandle Producing & Refining Co., Wichita Falls, Tex.; W. Alton Jones, chairman, transportation committee, District 1, president, Cities Service Co., New York; Ralph B. Lloyd, president, California Oil and Gas Association, Los Angeles, Calif.; J. M. Lovejoy, president, Seaboard Oil Co. of Delaware, New York.

Charles P. McGaha, president, National Stripper Well Association, Wichita Falls, Tex.; N. C. McGowen, chairman, natural gas and natural gasoline committee, District 3, president, United Gas Pipeline Co., Shreveport, La.; B. L. Majewski, chairman, marketing committee, District 2, vice president, Deep Rock Oil Corp., Chicago; A. C. Mattei, president, Honolulu Oil Corp., San Francisco, Calif.; Parker L. Melvin, president, Pennsylvania Grade Crude Oil Association, Oil City, Pa.; William Moeller, chairman, natural gas and natural gasoline committee, District 5, vice president, Southern California Gas Co., Los Angeles, Calif.; S. B. Mosher, president, Signal Oil & Gas Co., Los Angeles, Calif.; Henry D. Moyle, chairman, refining committee, District 4, vice president, Wasatch Oil & Refining Co., Salt Lake City, Utah; Burton W. Musser, chairman, transportation committee, District 4, general counsel, Utah Oil Refining Co., Salt Lake City, Utah.

John W. Newton, chairman, refining committee, District 3, vice president, Magnolia Petroleum Co., Beaumont, Tex.; I. A. O'Shaughnessy, president, Globe Oil & Refining Co., St. Paul, Minn.; J. Howard Pew, president, Sun Oil Co., Philadelphia, Pa.; Frank Phillips, chairman, general committee, District 2, chairman of Phillips Petroleum Co., Bartlesville, Okla.; E. E. Pyles, chairman, production committee, District 5, Los Angeles, Calif.

E. B. Reeser, president, Barnsdall Oil Co., Tulsa; J. French Robinson, chairman, natural gas and natural gasoline committee, District 1, president, East Ohio Gas Co., Cleveland, Ohio; W. S. S. Rodgers, president, Texas Co., New York; Charles F. Roeser, chairman, general committee, District 3, Roeser & Pendleton, Fort Worth, Tex.

E. G. Seubert, chairman, transportation committee, District 2, president, Standard Oil Co. (Indiana), Chicago; R. S. Shannon, chairman, production committee, District 4, president, Minnelusa Oil Corp., Denver, Colo.; H. F. Sinclair, president, Consolidated Oil Corp., New York; W. G. Skelly, president, Skelly Oil Co., Tulsa; W. L. Stewart, Jr., chairman, refining committee, District 5, vice president, Union Oil Co. of California, Los Angeles, Calif.

Reese H. Taylor, president, Union Oil Co. of California, Los Angeles, Calif.; Lawrence Vander Leck, president, Oil Producers Agency, Los Angeles, Calif.; R. van der Woude, president, Shell Union Oil Corp., New York; E. V. Weber, president, Ohio Petroleum Marketers Association, Cincinnati, Ohio; N. H. Weber, president, National Petroleum Association, Chicago; H. C. Wiess, chairman, transportation committee, District 3, president, Humble Oil & Refining Co., Houston, Tex.; Robert E. Wilson, Pan-American Petroleum & Transport Co., New York.

Standing Committees

Standing committees of PIWC are as follows:

Standing committee on production—O. D. Donnell, chairman; Walter S. Hallanan; George A. Hill, Jr.; E. E. Pyles, and R. S. Shannon.

Standing committee on natural gas and gasoline—J. French Robinson, chairman; Burt R. Bay; Robert W. Hendee; N. C. McGowen, and William Moeller.

Standing committee on refining—R. H. Colley, chairman; Paul G. Blazer; Henry D. Moyle; John W. Newton, and W. L. Stewart, Jr.

Standing committee on transportation—W. Alton Jones, chairman; Charles S. Jones; Burton W. Musser; E. G. Seubert, and H. C. Wiess.

Standing committee on marketing—B. L. Majewski, chairman; C. S. Beesemyer; J. W. Carnes; H. Earl Clack, and Roy B. Jones.

Temporary pipe-line management committee—W. Alton Jones, chairman; H. C. Wiess; R. H. Colley; W. S. S. Rodgers; J. E. Dyer, secretary; E. G. Seubert; R. W. Gallagher, vice chairman;

(Continued on Page 30)

Left: Members and observers at the District 2 production committee meeting. Left to right: J. E. Bartley, Ohio Oil Co.; H. B. Fell, Independent Petroleum Association of America; A. S. Ritchie, McPherson Drilling Co.; Wirt Franklin, director of production for District 2; E. D. Wallace, Petroleum Exploration Co.; N. W. Shiarella, Kentucky Oil and Gas Association; C. C. Carroll, Ohio Oil Co.; H. M. McClure, Michigan Department of Conservation; A. W. McKinney, National Supply Co.; H. N. Pardee and M. L. Terry, Texas Co.; Ralph Pryor, Pryor & Lockhart; Clarence T. Smith, Pure Oil Co.; C. D. Watson, Carter Oil Co.; Alex McCandless, Illinois-Indiana Petroleum Association; C. P. Dimit, Phillips Petroleum Co.; L. F. McCollum, Carter Oil Co. and Don R. Knowlton, OPC director of production. Right: Meeting of the advisory board of the Illinois Basin chapter of A.P.I. Left to right around the table: J. F. Wilson, Sohio Corp.; A. H. Bell, Illinois Geological Survey; H. F. Sackett, Fisher Oil Co.; Barney Whisenant, Whisenant & Trenchard; Jake Haas, Adams Oil & Gas Co. and chairman of the chapter; Tony Keating, Robey-Keating Drilling Co.; Max Sherwood, Shell Oil Co., Inc.; R. B. Kelley, Pure Oil Co.; T. B. Steele, Kewanee Oil Co. and J. D. Sanford, Rock Hill Oil Co.

OPC Warning Repeated That Supply Rules Will Tighten

By HARRY F. SIMONS

Highlights of the talk by Don R. Knowlton at the Illinois-Indiana Petroleum Association and Illinois Basin chapter A.P.I. meeting.

Drilling in a 2 months' period after full effect of M-68 is off to 58 per cent of comparable period last year.

The oil industry under restricted program will consume 4,000,000 tons of steel; almost 2,000,000 tons of this in production.

War effort will require an oil production of 3,500,000 to 4,000,000 bbl. daily.

There is a year's supply of steel available to the oil industry. Beyond that no program for new steel has been approved.

After July 23 there may be closer restrictions than now under M-68. All automatic exemptions may cease.

Illinois congratulated for wildcatting campaign amounting to 25 per cent of total drilling; national average is 12.4 per cent.

ROBINSON, Ill.—Over 400 members of the Illinois-Indiana Petroleum Association and of the Illinois Basin chapter of the A.P.I. got a more serious picture of the present war situation, its effect on their business and an indication of the changes in government regulation at the combined meetings of the two groups here June 6. To add to the attention focused on Robinson for the day, the production committee for District 2 also held a lengthy session.

This committee was appointed some months ago by Coordinator Ickes to consider oil-production problems in the 17 Middle West states. Normally the committee meets in St. Louis, Mo., but was transferred to Robinson for the occasion as Don R. Knowlton, director of production for OPC could then attend.

Dr. George S. Benson, president of Hardin College, Searcy, Ark., was one of the principal banquet speakers

There was little doubt in anyone's mind after hearing Mr. Knowleton's address on Saturday evening that the situation was to change from the present restrictions to more rigid ones. Mr. Knowlton indicated that the P-98 order under which the industry has been getting its materials was about to be replaced except for maintenance and repair materials. He said that M-68 would be replaced in July with the Project Rating Plan under which each individual operation would be granted permission to use material, and that there would be a pooling of present equipment in warehouses and yards with the entire industry drawing from this stock pile.

For the most part, there was a spirit of cooperation shown by members of the industry present and an evident willingness to do all possible to keep the nation supplied with oil although lacking material to carry on any considerable development campaign. The only evidence of discord was the reluctance to accept gasoline rationing in the "flooded" Middle West and in areas where gasoline is available in surplus quantities.

O. D. Donnell, president of Ohio Oil Co. and chairman of the District 2 production committee, who presided at the evening session, remarked that the gasoline rationing was due to the shortage on the East Coast and the desire on the part of government officials for rubber conservation. Rationing in the Middle West would be of little help to the East, and according to Mr. Donnell he didn't believe there was an acute rubber shortage existing as there were probably 3,000,000 tons of rubber on old tires which could be reclaimed. He also indicated that the Office of Price Administration was balking the publication of some of the figures presented to that office.

Mr. Knowlton's address was a comprehensive review of the problem facing the oil industry. He praised the work of the men responsible for the nation's war production (Messrs. Nelson, Batt, Knowlson, and Knudsen) and the oil industry for its solidarity in meeting the present emergency.

Reduction of 40 Per Cent

According to Mr. Knowlton, some realized from the start that the steel shortage was going to be extremely acute. At that time, there were several courses open but a complete shutdown was passed over in favor of a system whereby a number of wells could automatically be drilled under M-68 and P-98. An arbitrary ceiling was picked for new developments and it was estimated that M-68 would restrict drilling 40 per cent.

For the 2 months preceding, which allows time for wells started before M-68 to be completed, the record shows there were 58 per cent as many wells drilled as during the comparable period in 1941, Mr. Knowlton said. The order has necessarily affected different areas in different ways.

Under the restricted program now in effect, it is estimated that the oil industry will require 4,000,000 tons of steel and that 48 per cent of this will go into production, including drilling of oil. It was this 2,000,000 tons which the War Production Board was unwilling to allow to be used to develop new reserves to add to the 20,000,000,900 bbl. in existence. After some difficulty, WPB was convinced that this reserve was not a readily available source of supply and that new drilling would be necessary. The fact that the average well consumes steel to make a pair of 30-ton tanks, still bulks large to WPB, however, Mr. Knowlton added.

At the present time, according to Mr. Knowlton, there is available approximately enough tubu-

lar material to last a year at the current rate of drilling. During 9 months of this period little difficulty should be encountered in finding the desired sizes and weights of casing and tubing but during the latter 3 months considerable substitution will be necessary. No provision has been made in present plans for rolling more tubular steel over the next 2 years.

In face of the fact that this nation may be called on to supply all the United Nations, everyone in the oil industry has the responsibility of getting the most oil possible out of the ground and the discovery of new sources of supply is extremely important.

On the future of M-68, Mr. Knowlton commented that no one was contending that 40 acres was the best spacing from a recovery or operating standpoint in any particular area but that there just wasn't enough steel to go around. Illinois occupies a particularly important position because of its relation to the market and to the East Coast shortage area. For this reason it could be considered for an exemption from M-68 and one well authorized to 20 acres even where the well was deeper than 2,500 ft. On the other hand, California with its heavy oil is another vital area as it will be called on to supply much of the fuel oil. Each application for exemption from M-68 must continue to be decided on its individual merits.

Exemptions May Cease

As far as restrictions are concerned, "We just haven't seen the beginning. After July 23 there may be a closer restriction. All automatic exemptions may cease; M-68 may look awful good then," Mr. Knowlton said.

Mr. Knowlton congratulated Illinois on its recent wildcatting campaign. It was hoped by OPC that by this time there would be 4,000 to 5,000 wildcats drilled during the present year, he said. Actually, up to May 23, there were 1,084. The percentage of wildcats during 1941 was 10.1 per cent. So far this year, wildcat drilling accounts for 12.4 per cent of the total. Illinois, however, shows wildcat completions running 25 per cent of the total drilling. The wildcatting situation is still far from satisfactory.

The other speaker at the evening session was Dr. George S. Benson, president Harding College, Searcy, Ark., who scored the lack of cooperation on the part of all citizens in the war effort. The principal difficulty is the desire for a profit which is uppermost in many minds. Dr. Benson called for a five point program which he believed necessary if free enterprise is to be maintained in this country. These were: (1) an aroused public; (2) control of nondefense spending and an effective price control; (3) a strong Congress; (4) new emphasis on religion, and (5) reselling the American people on the value of our system of government.

Next meeting of District 2 Production Committee will be held in Lansing, Mich., on July 11. At the meeting Saturday, the committee received reports on the progress of state subcommittees on well spacing, secondary recovery, and engineering progress. At the present time the principal task of the committee is a study of the sustained and efficient production of wells and pools and the reserves of the district.

A brief discussion at the A.P.I. meeting Saturday was followed by the showing of a moving-picture film of the running of the first fiber pipe in an oil well. (See The Oil and Gas Journal, p. 61, May 28, 1942.). At a meeting of the executive committee it was decided to hold election of officers and the regular annual session on September 17. The nominating committee is composed of R. B. Kelley, Pure Oil Co.; T. B. Steele, Kewanee Oil Co., and J. F. Wilson, Sohio Corp.

This Week...

RATIONING.—Decision on spreading scope of restrictions rests with White House. Interior congressmen continue opposition. Trade associations, state administrations and motorists, in areas of abundant supplies, intensify fight against plan. President gathering data, promises full discussion of decision. . . . Industry council submits report on rubber situation. Sees need for continuing operation of all mechanically serviceable cars, to protect economy, maintain maximum war production. . . . Unlimited cards abolished in permanent plan for East Coast states. Basic ration in eastern area will be around 4 gal. per week, enough to drive about 2,880 miles annually, or 50 per cent under normal mileage. . . .

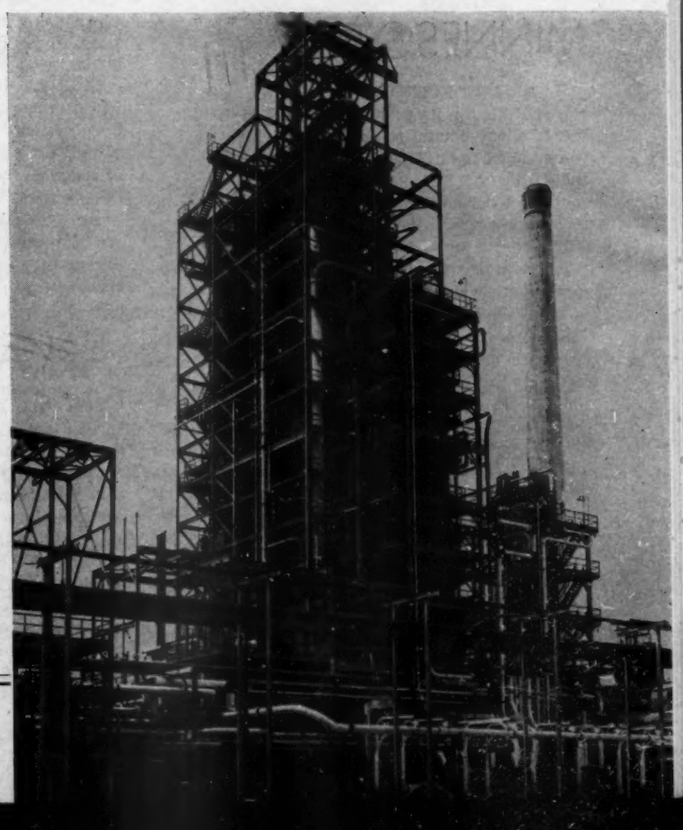
MARKETING.—Petroleum Industry War Council recommends abolishment of credit cards. . . . Product demand continues high in most areas. . . . Gasoline gallonage in March, for the entire country, dropped 1.88 per cent below a year ago. First recession in demand for long period. Consumption holding above expectations of most observers. . . . Real test of demand trend not yet reflected in complete figures, downward curve anticipated. . . .

RUBBER.— Rubber Reserve Corp. advances price of scrap to $25 per ton, hoping to free hoarded stocks, increase volume of reclaim. Makes no commitments about supplies for civilians. However, may fit into PIWC suggestion. . . .

TRANSPORTATION.—The Navy is hinting that control of submarines along the United States coastline, is or soon will be, improved, possibly permitting more freedom in tanker movement. Such results may be deciding factor in WPB's ruling on 24-in. pipe line. Donald Nelson appoints special committee to study East Coast conditions. . . . Tanker movement resumed, to limited extent, along Pacific Coast, permitting transfer of 2,500 tank cars from that area to eastern service. Temporarily delays withdrawal of additional equipment from Middle West. . . . Rail shipments to East Coast declined to 664,230 bbl. daily in week ended May 30, off 6 per cent from all-time peak of 706,800 bbl. daily in previous week. . . . Pipeline projects may benefit from liberalization of Conservation Order L-41. Red tape still confusing and delaying. Idle pipe-line capacities found to be less than estimated, on detailed examination, possibly diminishing potentialities of relocation program. Some reclaimed pipe found deficient. . . .

REFINING.—First fluid-catalyst cracking unit placed in operation; results exceed expectations. Thirty other similar units under way. . . . Eight independent refiners in South Oklahoma and North Texas organize cooperative company to build 100-octane refinery, all contributing charging stock. . . . Trend away from maximum gasoline production continuing in all refining districts. . . . Negotiations completed between Government and Humble Oil & Refining Co., for two synthetic-rubber plants—one for butyl type, another for butadiene.

PRODUCTION.—Discovery of production in Hickory sand, middle Cambrian, below the Ellenburger, in Pecos County, Texas, gives still another pay at which to shoot. . . . Rumors that pipe line will be built from the McMurray area to Edmonton, Canada, indicates expanded development of Athabaska tar sands. . . . Crude stocks increased 1,600,000 bbl. in week ended May 30. . . . Another warning given industry that materials will become tighter later this month. . . . Replacement of P-98 with Production Requirements Plan as medium of obtaining materials in prospect, possibly accompanied by pooling inventories of supplies and distribution from common pool. . . . OPC and other Washington agencies seeking ways of stimulating exploration. Wildcats accounting for less than 13 per cent of total drilling which OPC wants raised to at least 25 per cent. . . .



This imposing unit, as high as a 20-story building, is the first commercial-scale fluid-catalyst cracking unit to go into service for production of 100-octane gasoline and raw materials for synthetic rubber. Thirty similar units are under construction throughout the country

STATE CAPITALS...

CALIFORNIA

THE AXIOM that a contract is a contract was borne out in a Los Angeles Superior Court last week when Superior Judge Frank G. Swain ruled that no service-station operator may cancel his lease covering ground for his station without the consent of the owner of the property, despite priorities, tire rationing, and other difficulties that have reduced the business of the station. The plaintiff petitioned the court for relief inasmuch as the sale of oil and gasoline had been reduced 50 per cent because of government war restrictions, and that tire rationing and priorities restrictions on accessories had so changed the original conditions of the lease as to render it cancelable. The court sustained the defendant's demurrer and held that the high courts had established a rule against such actions during the early part of the prohibition period.

The ruling will be appealed, and while this was to be expected, the court's decision will prevent many other station operators from taking similar action. This decision hits the larger marketer just as it hits the independent station operator because most of the larger marketers have noncancelable leases upon which they will be forced to pay rentals irrespective of how long the war lasts. Some have been able to secure reductions in rentals through the cooperation of the landowner but this is purely a voluntary matter. Many stations throughout the Pacific Coast territory have been adversely affected by war conditions and by the rerouting of traffic under Army direction. This condition has not yet been given to the court for decision and much depends upon what is contained in the contract.

MINNESOTA

E. B. HAEDECKE, director of the Minnesota war petroleum program, speaking on behalf of the advisory committee of that organization, last week called upon Joseph B. Eastman, director of the Office of Defense Transportation, to grant relief to local haulers of fuel oil in Minnesota for the summer months from the requirements of ODT Order 6 in so far as said order provides for a cutback in the use of fuel-oil delivery trucks to a monthly mileage of only 75 per cent of that of the corresponding month of 1941.

Reasons for the request are that fuel-oil deliveries are normally very small during the summer months, deliveries during the summer of 1941 being no exception to the general rule. Because of the strain on transportation caused by prosecution of the war and the necessity for making full use of transportation facilities from the sources of oil supplies to Minnesota, it is necessary that as much fuel oil as possible be stored in the tanks of the home consumers.

Mr. Haedecke also protested against the threat of gasoline rationing in Minnesota. The committee opposes gasoline rationing in Minnesota as needless.

Distances in Minnesota, Mr. Haedecke told Leon Henderson, director of OPA, are greater and the commuting services are not complete as compared to those in the densely populated regions. Therefore, motor vehicles being the chief mode of transportation in this area, it is necessary that adequate supplies of gasoline be made available in order to maintain arteries of travel.

Minnesota is primarily an agricultural state, he said. Maintenance of agricultural activities depends in a great measure on an unrestricted supply of petroleum products. The petroleum products are necessary not only in supplying the agricultural producer with his needs, but also in the production of the crop and in the movement of the crop from farm to market.

Adequate facilities for transporting gasoline to Minnesota are now available and not essentially needed for other uses. These facilities are made up primarily of pipe lines, barge lines, and lake tankers. The industry is well set up to distribute petroleum products from storage terminals to ultimate points of distribution.

The public in Minnesota is doing its job of conserving tires beyond the point now required by regulations. Illustrative of the progressive decline in highway travel are statistics compiled by the Minnesota State Highway Department, which show that beginning January 1942 travel was 2.13 less than January 1941; in February 1942 6.5 per cent less than February 1941; March 1942, 11.5 per cent less than March 1941; and April 1942, 18.2 per cent less than April 1941.

KANSAS

NATURAL-GAS PRODUCTION of 774,588,000 cu. ft. daily for the Cunningham field in Kingman and Pratt counties and of 490,000,000 cu. ft. daily for the Otis field of Rush and Barton counties during June has been authorized by the Corporation Commission.

OPERATORS IN THREE fields in Barton and Russell counties have been called to a special Corporation Commission hearing at Wichita, Kans., June 15 for the purpose of recommending a spacing pattern to conform to Conservation Order M-68. Fields involved are Trapp, West Trapp and Karst.

OPC requested the commission to hold the hearing and to prepare a recommendation on well spacing for submission to the coordinator.

ARKANSAS

THE OIL AND GAS COMMISSION issued a special order June 1 concerning the production of sweet-gas reserves. The largest known Arkansas reserves of sweet gas exist in the Dorcheat and Macedonia fields of Columbia County. The wells in these fields are now producing sour gas and distillate from the Smackover lime at around 9,000 ft. The sweet gas and oil reserves are found in the Cotton Valley sand at depths varying from 7,000 to 8,200 ft. There are some 17 productive lenses, engineers of the Oil and Gas Commission say, but no single productive horizon that extends over the entire field. The commission's order states that one lens from the Cotton Valley sand may be produced at a time through wells already existing in the field, the deep pay, or Smackover lime, to be produced through the tubing while the shallow pay, or Cotton Valley, is to be produced in the space between the tubing and the casing. The commission further ordered that wells be mechanically equipped so there would be no commingling of sweet and sour gas and that the production be maintained and measured separately.

The sour gas pay is limited to one well to 80 acres by special arrangement with the Office of the Petroleum Coordinator. The usual gas fields in the United States are spaced one well to each 640 acres, but special dispensation was made in the case of Arkansas, where more wells are needed to supply war industries. No spacing requirements are to be issued on the Cotton Valley or sweet-gas section of the fields and only the production will be considered in the orders of the commission.

Any operator who elects to do so may complete his well in such a manner as to permit the production of oil or gas from the Smackover lime through the tubing and oil or gas from one lens of the Cotton Valley formation only through the annular space between the tubing and casing, subject to the following conditions:

1. That sufficient notice must be given the director of production of the commission to enable him to notify all other operators in the Dorcheat or Macedonia fields of a proposed dual completion into one of the multiple zones of the Cotton Valley sand.

2. That these dual completions shall be made in such mechanical manner as will meet with the approval of the director of production and chief engineer of the commission.

3. That no sweet gas shall be produced from the Cotton Valley formation through a dual completed well or any other well for any purpose other than as provided by Act 105 of 1939. No sweet gas shall be permitted to escape to the air.

4. That each well dually completed in the Cotton Valley sand shall be regarded as a separate and distinct well; that a permit shall be secured for the dual completion as though the well were a new well; that the production shall be taken separately and measured separately; and that all rules, regulations and orders governing individual oil or gas wells shall be strictly adhered to.

TEXAS

A NEW SCALE of allowables for wells in new fields has been established by the Railroad Commission, authorizing production of from 20 to 240 bbl. daily, depending on depth. The amended order applies "only to wells in each new field discovered after June 1 and shall apply to such wells for a period of 1 year after completion of the discovery well or until more than five wells have been drilled and completed.

The scale of new-well allowables is based on depths as follows:

Depth—	Daily allowable (bbl.)
0- 1,000	20
1,000- 2,000	40
2,000- 3,000	60
3,000- 4,000	80
4,000- 5,000	100
5,000- 6,000	120
6,000- 7,000	140
7,000- 8,000	160
8,000- 9,000	180
9,000-10,000	200
10,000-11,000	220
11,000-12,000	240

THE NEXT STATE-WIDE proration hearing at which evidence will be accepted for future allowable orders has been set by the Railroad Commission for June 16.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Full Investigation Needed

Performance on the promise from the White House to "give the people some facts and reasons" on the rubber shortage should be preceded by a nonpolitical investigation—openly conducted—which will answer questions as to the why of what has been done affecting oil consumption and what is proposed for the future.

The inquiry should include the conditions which have brought about severe rationing in 17 eastern states and the District of Columbia and the slightly easier restrictions in the Pacific Northwest. This would cover the entire subject of petroleum transportation—pipe line, tankers, tank cars, barges and trucks.

Many within the petroleum industry for several weeks have assumed that the national rationing of motor fuels was inevitable. They accepted, without question, reports coming from supposedly official circles covering rubber supplies, consumption, and stocks, and also petroleum transportation conditions and, through the use of simple arithmetic, arrived at the conclusion that the reduced use of cars was necessary as a war measure.

Within the past 2 weeks practically every statement that has been made in connection with the rubber situation has been challenged. Car owners generally are confused and resentful as is apparent by asking a dozen of them as to the necessity of rationing gasoline in order to conserve rubber and to equitably distribute transportation facilities.

As to transportation there should be information as to whether the present minimum tanker shipments to the Atlantic seaboard and along the Pacific Coast must continue indefinitely. An enlarged movement this fall, made possible by adequate protection and the completion of new tankers, would not only lessen the petroleum rationing load to consumers in those areas but would also materially clear the atmosphere for the industry generally, including its customers.

There should be an immediate explanation as to why the several-point pipe-line program worked out by the petroleum industry and which has been approved by OPC is being held up through failure in some cases to obtain authority to move lines and equipment and to secure delivery on the small quantities of new materials that will be required.

As to synthetic rubber, those closest to this situation will agree that large-scale production from petroleum or other products, based on known processes, is not possible before 1944. But there may be short cuts to limited production. Substitutes have been suggested which would not give the service to which tire users are accustomed but which would be far better than parking cars in garages for the duration.

Statements are conflicting as to the storage of natural rubber and the new supplies which can continue to be made available from foreign sources. It is agreed that the government agencies have been dilatory in the matter of providing means to collect old tires. There is the feeling that full use of reclaimed rubber has not been provided for in the government program.

In that connection, a PIWC subcommittee has made an interesting report indicating that, through recapping with reclaimed rubber and a small quantity of new rubber, most of the cars can be kept in operation until synthetic rubber is available. There are other things that can be done short of general rationing. Speed restrictions should be enforced. Luxury use of cars should end.

It will not take long to collect the facts and what is equally important to coordinate them. That done, and a comprehensive statement issued, those directing the war effort will have the full cooperation of producers and consumers of petroleum in any program that needs to be made effective.

Price Relief Granted The Oil Industry Is Relatively Minor

By J. P. O'DONNELL

NEW YORK.—Even though it has suffered more severely than any other of the five major industries from the effects of the war, records of the Bureau of Labor Statistics show tthat the relief obtained by the oil industry in the form of higher prices has been comparatively minor. This fact should constitute a compelling reason for the adoption of a program that will enable the industry to offset higher costs occasioned by factors beyond its control.

Long before the entry of the United States into the war, the oil industry had lost a large part of its valuable export market. In the past 6 months, inability of the Navy to provide adequate protection for coastwise shipping forced restriction in the country's major consuming area and required the use of vastly more expensive transportation methods to supply that district's remaining demands. This backed up supplies in the interior and created distress conditions there. Now the loss of rubber sources threatens nation-wide rationing of gasoline, the industry's profit product. The industry faces a period of reduced demand for its principal product with greater unit costs but without compensating price increases.

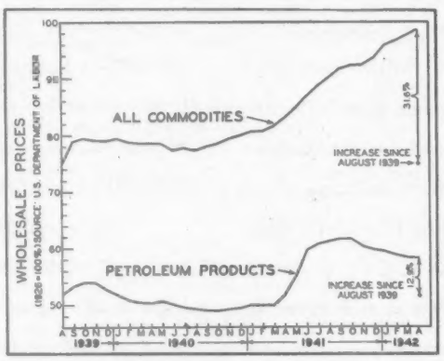
War Requirements Limited

The change in the character of the oil industry was not as great as that in the automobile industry but the complete conversion of the latter to the manufacture of planes and tanks insured it a market for all its products. The partial conversion of petroleum refining industry to the manufacture of 100-octane gasoline, synthetic rubber, and toluene provides it with a market for only a small fraction of its total production. None of the other major industries was so affected but in each of them, wholesale prices are substantially higher than those of oil.

The accompanying graph gives a comparison of petroleum products prices with wholesale prices of all commodities from August 1939 to April 1942, as compiled by the U. S. Department of Labor. It will be noted that the all-commodities' prices have risen 31.6 per cent above the August 1939 level while petroleum products wholesale prices have risen but 12.9 per cent from the last prewar month. A more detailed comparison of wholesale prices of various commodities is given in the table. This table compares the August 1939 index using 1926 as a base, or 100, with the March 1942 index and gives the percentage of change.

Only iron and steel, up 2.1 per cent, has shown a smaller gain among the major industries than petroleum. However this may be accounted for by the fact that in August 1939, iron and steel prices were almost twice as high as petroleum and products prices in relation to 1926. Despite their greater interim gain the latter are still 41.7 per cent below the 1926 normal price while the former are off only 2.9 per cent.

Coal, particularly bituminous, also showed a comparatively small gain since the beginning of war but it, too, started from a much higher level than petroleum. In March the bituminous coal index was up to 108.4 in contrast to petroleum's 58.3. Both the coal industry and the iron and steel industry have experienced increasing demands for their products in contrast to the declining demand for some oil products and neither has had to contend with the abrupt imposition of tremendous transportation costs that has afflicted the latter.



The course of commodity prices, showing lag of the petroleum index

Only agriculture, as shown by the wholesale grain price, entered the war period at a level lower than petroleum. It has regained almost all the ground lost since 1926 as its percentage gain of 82.1 shows against petroleum's 12.8 per cent.

The petroleum products index advanced rapidly in the spring of 1941 as it became apparent that the greatest demand in the history of the industry was developing. However, the adverse factors previously mentioned began to take effect and in March 1942 the petroleum index was actually below the October 1941 peak. During that period the only advances of consequence were those allowed to offset, to some extent, the higher costs resulting from changed transportation methods. The trend of the index indicates that those advances were not sufficient to make up for the declines in interior prices resulting from the backing up of supplies.

WHOLESALE PRICE COMPARISON (U. S. DEPARTMENT OF LABOR)

Commodity—	Index August 1939	Index March 1942	Per cent increase
Grains	51.5	93.8	82.1
Livestock, poultry	66.0	113.8	72.4
Dairy products	67.9	94.3	38.9
Fruits, vegetables	58.5	87.7	49.9
Meats	73.7	109.2	48.2
Shoes	100.8	124.3	23.3
Hides, skins	77.2	116.3	51.0
Leather	84.0	101.5	20.8
Clothing	81.5	106.6	30.8
Cotton goods	65.5	112.6	71.9
Woolens, worsteds	75.5	108.7	44.0
Anthracite coal	72.1	85.2	18.2
Bituminous coal	96.0	108.4	12.9
Coke	104.2	122.1	17.2
Petroleum and products	51.7	58.3	12.8
Iron and steel	95.1	97.1	2.1
Motor vehicles	92.5	112.7	21.8
Nonferrous metals	74.6	85.6	14.7
Brick, tile	90.5	97.1	7.3
Lumber	90.1	133.1	47.7
Chemicals	83.8	96.4	15.0
Oils and fats	40.6	108.8	168.0
House furnishings	85.6	102.6	19.9
Tires and tubes	60.5	71.0	17.4
Crude rubber	34.9	46.3	32.7
All commodities	75.0	97.6	30.1

Authorized Advances Insufficient

Even the advances allowed by the OPA to offset the increased transportation costs were in themselves less than the advances in other commodity prices. A summary of these advances and how they affected New York Harbor prices is shown below:

Per gallon (cents):	Jan. 1	Apr. 29	Per cent increase
Gasoline (72-74 oct.)	8.0	9.2	15.0
Kerosene	5.3	5.7	7.5
No. 2 fuel oil	5.2	5.9	15.4
Diesel oil	5.2	5.8	11.5
Per barrel (dollars):			
No. 6 fuel oil	1.35	1.80	33.3

These advances not only have been insufficient to offset losses elsewhere in the industry but it has been shown (The Oil and Gas Journal, May 7) and repeatedly stated that they have been insufficient to meet the higher costs which they were supposed to offset.

The comparatively modest advance in petroleum prices, 12.9 per cent against 31.6 for all commodities, has not been confined to wholesale prices but extends also to retail prices. The 50-city average service-station price of gasoline was 18.74 cents in August 1939 and 20.37 cents in May 1942, an increase of only 8.7 per cent.

Interpretations May Ease Restraint on New Lines

WASHINGTON, D. C.—Pipe-line relocation and oil-industry construction work in general may benefit somewhat from interpretations to Conservation Order L-41 just issued by the War Production Board.

This order requires a P-19 priority order before starting any commercial construction project costing $5,000 or more. The new interpretations liberalize the order in several respects, such as eliminating cost of grading and the value of used material which does not change ownership in arriving at the estimated cost of $5,000 or more.

Officials of the Office of Petroleum Coordinator deny reports from the oil region that the L-41 procedure is hampering the pipe-line relocation program materially. While admitting that the procedure involves a considerable amount of red tape, they insist that L-41 applications involving pipe-line relocations are rushed through if filed in proper form with the OPC. OPC insists that the relocation program is proceeding as rapidly as can be expected.

Plans for building a line across northern Florida have not yet been completed, but negotiations with several interested companies are actively under way.

Protection of Coastal Waters May Decide Pipe-Line Issue

WASHINGTON, D. C.—Hints dropped by the Navy Department in recent days that the submarine menace along the Gulf and Atlantic coasts will soon be overcome may determine the action of the War Production Board on the long-sought allocation of steel for a 24-in. crude-oil pipe line from Texas to the eastern refining area.

WPB Chairman Donald Nelson has appointed a special committee to study the application for the line submitted by the Office of Petroleum Coordinator. Because of the shortage of steel, the decision apparently will rest on the estimates of this committee as to the possibilities of supplying minimum essential demands of the eastern states for petroleum products during this fall and winter by means other than the new pipe line. If confidential advices make it appear that protection of the coastwise sea lanes will permit tankers to bring in supplies sufficient to make up the indicated shortage the chances are that the line will not be allocated steel.

Naturally very little is being said by the naval authorities, but a number of published reports indicate that plans are being perfected to patrol the coasts with large fleets of small armed vessels, and several officials have expressed the conviction that submarine activity close to United States shores has passed its peak and that tankers will be moving in considerable number again very soon.

The report of the committee on petroleum economics submitted to the Petroleum Industry War Council last week was slightly less pessimistic regarding East Coast supplies than some earlier estimates, though it stressed the fact that unless tanker deliveries can be assured there must be a large increase in shipments by other means.

The special committee to consider the status of petroleum supplies in the East Coast appointed by Mr. Nelson is headed by Wayne Johnson, special adviser to the WPB chairman on petroleum matters.

The committee will also consult with the Maritime Commission and with the OPC in regard to recent pipe-line recommendations made by the coordinator's office.

Other members of the committee are Jesse Jones, federal loan administrator; Gen. W. B. Pyron, representing the secretary of war; Comdr. W. M. Callaghan, representing the secretary of the navy; Isidor Lubin, representing Harry L. Hopkins; Charles Rayner, representing Vice President Henry A. Wallace; A. R. Glancey, representing Lt. Gen. William S. Knudsen, and Glennon Gilboy, representing Price Administrator Leon Henderson.

•

Rationing Decision Pending

WASHINGTON, D. C.—Upon President Roosevelt apparently rests the decision whether automobile tire conservation will be forced by nation-wide gasoline rationing in the near future or whether voluntary means will be tried a while longer.

The War Production Board, Office of Price Administration, and Office of Defense Transportation are ready to institute a nation-wide rationing plan on short notice, but a congressional revolt against restrictions outside of the shortage area has become so strong that the problem has been laid at the door of the White House.

The president discussed the subject June 5 at a conference with high administration officials. Those participating were Secretary of Commerce Jones, Secretary of Interior Ickes, Under Secretary of War Patterson, Budget Director Smith, WPB Chairman Nelson, ODT Director Eastman, WPB Rubber Coordinator Arthur Newhall, OPA Fuel Rationing Chief Joel Dean, Director Archibald McLeish of the Office of Facts and Figures, and Wayne Coy, administrative assistant to the president.

Congressional opposition to gasoline rationing has become more outspoken every day during the week, and has been joined by a number of administration stalwarts. Rep. Jed Johnson of Oklahoma introduced a resolution declaring it to be the sense of Congress that rationing should not be imposed until administrative officials submit to the House full information necessary to show that rationing is necessary to save tires. This resolution followed an unofficial caucus of about 100 members of the House which protested rationing plans and appointed a committee to confer with President Roosevelt early this week.

Meanwhile the OPA and ODT proceeded with plans for a permanent rationing system for the East Coast region to replace the temporary "meal ticket" card system which expires June 30. Full details of the new system were not revealed, but a lengthy statement from OPA announced that there would be no "X" cards permitting unlimited purchase of gasoline, and that all purchases must be made on coupons which dealers must turn in when obtaining new supplies.

Presumably the new system is designed for nation-wide use if, as and when such is decided upon. The new ration is based on allowing 2,880 miles of driving per year for nonessential purposes, which is estimated to be about one-half normal average passenger car use. On the basis of 15 miles per gallon, this would mean a little less than 4 gal. per week. The East Coast ration is now about 3 gal. per week, so present indications are that the ordinary householder in the East will get slightly more gasoline than he has been permitted to purchase since May 15.

The OPA also directed local rationing boards to require the surrender of any gasoline ration cards found to have been obtained by fraud or misrepresentation or used for purposes other than those stated in obtaining them. OPA also announced that motorists applying for supplemental cards must prove that they are participating in plans for pooling cars by transporting others to work.

Another OPA announcement warned gasoline dealers against "black market" activities in selling gasoline without taking up coupons under the new system, and outlined the audit control system which will govern filling-station deliveries.

Regulations of the Office of Defense Transportation will control the amount of rations to be issued trucks, buses and government-operated cars under the new coupon plan for gasoline rationing, OPA announced.

In announcing that federal auto use tax stamps for the year beginning July 1 will be on sale at all post offices June 10, the Bureau of Internal Revenue said that the serial numbers on these stamps will be used in connection with the gasoline rationing system.

•

Financial Aid to Industry Provided in Connally Bill

WASHINGTON, D. C.—A plan for a government corporation to buy and sell petroleum and petroleum products as a solution to the problem of increased costs of refining and transportation is incorporated in a bill introduced by Sen. Tom Connally of Texas. A similar bill probably will be introduced in the House by Rep. Clarence F. Lea, of California, chairman of the committee on interstate and foreign commerce.

The bill would creat the War Petroleum Corp. with capital of $500,000,000 subscribed by the U. S. Treasury, having the usual powers and privileges of other government corporations. It would be incorporated by the Petroleum Coordinator for War and directed by him through a deputy as executive officer of the corporation. It would exist only for the duration of the war and thereafter only for liquidation.

Among the powers proposed for the War Petroleum Corp. are: To make loans; to purchase petroleum and products at prices set by the coordinator and sell them at not more than ceiling prices set by the Office of Price Administration; to pay transportation charges; to transport and store petroleum and products above or below ground; to cause supplies to be delivered to areas where there is an imminent shortage; to direct the construction, conversion or relocation of storage and transportation facilities; to direct the conduct of refinery operations to secure necessary amounts of particular petroleum products; to maintain adequate reserves and production of petroleum and products of strategic quality or location; to return to underground reservoirs or othewise dispose of petroleum products purchased by the corporation for the purpose of assuring necessary production of other products.

Rail Shipment of Oil East Declines To 664,230 Bbl. Daily

WASHINGTON, D. C.—The decline of 6 per cent in rail shipments of petroleum into the East Coast area during the week ended May 30 in which movement averaged 664,230 bbl. daily compared to 706,800 bbl. daily in the previous week indicates that the saturation point is near until additional cars are made available for that service.

The decline was due, the Office of Petroleum Coordinator explained in its weekly report, to the fact that most of the 2,265 additional cars pressed into service in the week ended May 23 had not yet had time to return to the West for reloading. Floods in northeastern Pennsylvania also contributed somewhat to the decline.

Oil shipments from California to Oregon and Washington also dropped off—from 16,296 bbl. daily in the week of May 23 to 8,679 bbl. daily. The decrease in movement reflects the improved stock position of the two northwestern states.

In shipping 664,230 bbl. daily into the East, the 27 companies that participated in this movement reported that they loaded 22,141 cars. Including cars that were on the way back west for reloading, it is estimated that the East Coast service was employing 53,400 cars.

Stimulation of Scrap-Rubber Collection Fits PIWC Plan

WASHINGTON, D. C.—Decision of the federal rubber agencies last week to stimulate the collection of scrap by offering $25 per ton, double the previous price, may offer a partial solution to the automobile tire situation. Reclaimed rubber is the key to a program suggested by an advisory group to the Petroleum Industry War Council's committee on synthetic rubber for maintaining all mechanically serviceable cars in operation through 1944.

The subcommittee calculated that only 5,100,000 civilian passenger cars will be retired from service because of mechanical failure during the next 2½ years. Conservative speeds, adequate reclaimed and crude rubber for recapping and a limited number of new tires are prerequisites to the program which would require relatively small percentages of the supplies.

TABLE 1—UPPER AND LOWER LIMITS OF PASSENGER CARS IN USE IN THE UNITED STATES BY YEARS, 1941-1947

(In millions of cars)

End of year—	Mechanically usable cars with no replacements and adequate rubber	Car in use with no replacements, no additional rubber at normal speed and mileage
1941	27.8	27.0
1942	25.6	23.7
1943	23.9	9.0
1944	21.9	1.2
1945	19.6	0
1946	17.0	0
1947	14.0	0

TABLE 2—GAIN IN PASSENGER CARS IN USE ATTAINABLE BY ORGANIZED CONSERVATION

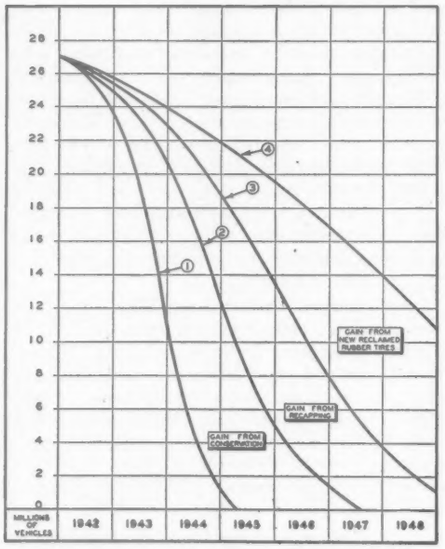
(In millions of cars)

End of year—	Cars in use without conservation and without additional rubber	Cars in use with conservation but without additional rubber	Gain in cars in use (difference)
1941	27.0	27.0	0
1942	23.7	24.8	+1.1
1943	9.0	20.4	+11.4
1944	1.2	12.3	+11.1
1945	0	5.6	+5.6
1946	0	1.6	+1.6
1947	0	0	0

Five premises were established by the advisory group in projecting the conclusions reached. Total automobiles in service at the end of 1944, assuming that prewar speeds and mileage were continued by the 27,000,000 passenger cars now operating, would be reduced to 1,200,000. Only 12,300,000 cars will continue in service through 1944, the advisory committee concluded, if motorists observe rigidly conservative driving habits and if they are denied tire recapping materials and replacements.

The advisory subcommittee on rubber economics is composed of Joseph E. Pogue, vice president of the Chase National Bank, New York, chairman; W. C. Allen, C. L. Burrell, W. L. Finger, R. S. Mitchell, L. W. Moore and George H. Taber, Jr.

"This report shows," declared the committee, "that our civilian automobile economy can be kept alive, if not vigorous, by the expenditure of an almost insignificant volume of natural rubber and a surprisingly small tonnage of reclaimed rubber. The latter can probably be provided from the inventories and discards in the hands of automotive users themselves."



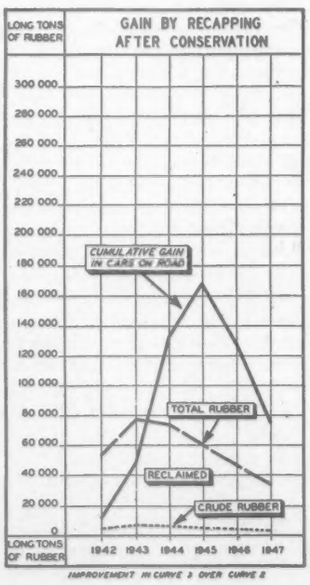
Curve 1: Normal speeds and car mileage (9,000 miles per vehicle per year)—no recapping. Curve 2: Forty miles per hour top speed and 25 per cent reduction in passenger car mileage—no recapping. Curve 3: Forty miles per hour top speed and 25 per cent reduction in passenger car mileage—with recapping. Curve 4: Same as Curve 2 plus adequate rubber to keep all usable cars on the road

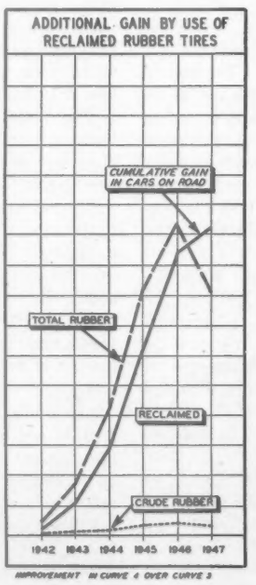
The committee said the reclaiming program is hampered by tendency of drivers to hoard worn tires and discards and use tires beyond the point of recapping and recommended price incentives to encourage collection of scrap and manufacture of reclaimed rubber. A nation-wide plan for using filling stations as collection points with commissions for dealers, and a system of certificates permitting a driver to purchase one recap for each discard turned in or one reclaimed-rubber tire for each two discards. The report said that synthetic rubber may not be available before 1944, and if some program is not adopted in the meantime there will be a disastrous drop in cars on the road which will upset the entire economy.

The committee estimated there are now 27,000,000 passenger cars in use, and without a program there will be only 1,200,000 in use by end of 1944. With careful use and curtailment of driving to essential uses, much of which is being done now, there will be 12,300,000 cars left in use by end of 1944, but with adequate recapping materials available there will be 19,000,000 cars and with reclaimed rubber tires available there will be 21,900,000 cars in mechanical condition to operate.

The recap program alone, the committee estimates, from now until the end of 1944 would require a total of only 17,600 long tons of crude rubber and 187,600 tons of reclaimed, and both recapping and new tires of reclaimed rubber would require a total of only 23,300 long tons of crude and 308,600 tons of reclaimed rubber. Program would require only 20 per cent of reclaiming capacity the first year, 35 per cent the second, and 50 per cent the third, and by a system of cycling it is estimated motorists could provide themselves with tires through utilization of scrap rubber not now being collected and without draining scrap or important quantities of crude from other uses.

"As a result of the statistical studies," the committee summarized, "it has been shown that the normal decline curve of passenger cars in serv-





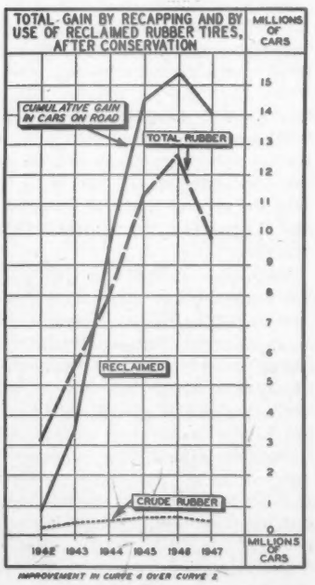


TABLE 3—GAIN IN PASSENGER CARS IN USE ATTAINABLE BY RECAPPING AND ITS COST IN RUBBER

Year—	Millions of cars end of year: Cars in use with conservation	Cars in use with conservation and recapping	Gain in cars in use (difference)	Rubber needed (Thousands of long tons per year): Crude	Reclaimed	Total
1941	27.0	27.0	0			
1942	24.8	25.4	+0.6	4.5	48.8	53.3
1943	20.4	22.8	+2.4	6.7	71.2	77.9
1944	12.3	19.0	+6.7	6.4	67.6	74.0
1945	5.1	13.5	+8.4	5.3	55.4	60.7
1946	1.6	8.0	+6.4	4.0	42.8	46.8
1947	0	3.8	+3.8	3.0	31.9	34.9

TABLE 4—GAIN IN PASSENGER CARS IN USE OVER THAT ATTAINABLE BY CONSERVATION AND RECAPPING, BY PROVIDING SUFFICIENT RUBBER TO KEEP ALL USABLE CARS ON THE ROAD

Year—	Cars in use with conservation and recapping	Cars in use with conservation, recapping and reclaimed tires	Gain in cars in use (difference)	Rubber needed (Thousands of long tons per year): Crude	Reclaimed	Total
1941	27.0	27.0	0			
1942	25.4	25.6	+ 0.2	0.4	8.4	8.8
1943	22.8	23.9	+ 1.1	1.7	32.7	34.4
1944	19.0	21.9	+ 2.9	3.6	79.9	83.5
1945	13.5	19.6	+ 6.1	7.2	157.6	164.8
1946	8.0	17.0	+ 9.0	8.8	197.6	206.4
1947	3.8	14.0	+10.2	6.5	156.4	162.9

TABLE 5—RUBBER REQUIRED TO MAINTAIN ALL USABLE PASSENGER CARS ON THE ROAD

(In thousands of long tons)

Year—	Rubber needed to recap existing tires: Crude	Reclaimed	Additional rubber needed to keep usable cars on road: Crude	Reclaimed	Total rubber required: Crude	Reclaimed
1942	4.5	48.8	0.4	8.4	4.9	57.2
1943	6.7	71.2	1.7	32.7	8.4	103.9
1944	6.4	67.6	3.6	79.9	10.0	147.5
1945	5.3	55.4	7.2	157.6	12.5	213.0
1946	4.0	42.8	8.8	197.6	12.8	240.4
1947	3.0	31.9	6.5	156.4	9.5	188.3

SUMMARY OF RUBBER REQUIREMENTS

(Long tons)

Year—	Needed to recap existing tires: Crude	Reclaimed	Total	Additional amount needed to keep all usable cars on road: Crude	Reclaimed	Total	Total amount required: Crude	Reclaimed	Total
1942	4,500	48,800	53,300	400	8,400	8,800	4,900	57,200	62,100
1943	6,700	71,200	77,900	1,700	32,700	34,400	8,400	103,900	112,300
1944	6,400	67,600	74,000	3,600	79,900	83,500	10,000	147,500	157,500
1945	5,300	55,400	60,700	7,200	157,600	164,800	12,500	213,000	225,500
1946	4,000	42,800	46,800	8,800	197,600	206,400	12,800	240,400	253,200
1947	3,000	31,900	34,900	6,500	156,400	162,900	9,500	188,300	197,800

ice can be tremendously improved by three steps, two of which require the expenditure of some rubber, predominantly reclaimed. No opinion is offered as to whether this rubber can be spared from the war effort, as this judgment must depend in part upon the course of future events and upon the speed with which synthetic rubber can be brought into large-scale production. But since the contemplated supplies can be drawn from sources not yet requisitioned by the war effort and difficult to obtain without inducements, hope may be entertained that a project so self-contained may be possible of accomplishment, at least in large part. And, should the occasion ultimately arise when the tires on the less essential automotive vehicles are needed for the war effort, more usable tires would then be available than if the steps here outlined had not been fully taken.

"The rubber cost, modest as it appears, is based upon conservative calculations and is probably on the high side, for two important factors of safety are present in the estimates. In the first place, present stocks of new tires and recapping materials are available to a restricted number of passenger cars and these factors have not been taken into account and, in the second place, the whole field of substitute tires has been left to one side, although technical developments of this kind are bound to assume considerable importance. It should be particularly emphasized, moreover, that the results envisaged in this report can only be attained by prompt action, for the lapse of a few months may permit a degree of tire wear that cannot be overcome by the contemplated steps."

•

ODT Truck Rules Concern Oil Executives

By PAUL REED

THE main outlines of Office of Defense Transportation plans for conserving the nation's motor-truck resources are widely accepted by executives in the oil industry as a sensible and businesslike method for dealing with a serious problem. However, at the same time, they are much concerned with the application of certain restrictions to conditions encountered in oil and gas operations which differ from those of general truck transportation.

An example of this is to be seen in the case of a drilling contractor who wishes to transport supplies to a well in his own truck. If the trip to the well is more than 25 miles his truck must be loaded to 100 per cent of capacity but not more than 20 per cent above capacity. On the return trip from the well the truck must be loaded to 75 per cent of capacity. If the load to the well is hauled by a common carrier, the more lenient rules applying to such operators may permit it to return empty if it is engaged in the "stream of traffic." However, the contractor may get relief from these restrictions by filing an application for an exemption with ODT. The term "capacity" as used in these orders means the rated load-carrying ability of the tires.

An amendment to the rules has promise of taking care of the requirements of trucks engaged in producing lease operations. It reads: "Any motor truck engaged exclusively in the transportation of repair or service men and their supplies or equipment when operated by such service men within the scope of their occupation or employment" are exempt. Although this appears to apply to all kinds of well-servicing operations, an attempt is being made to have ODT state this clearly. It is being assumed that producing lease trucks qualify for general maintenance.

Pipe-line maintenance trucks are exempt from complying with the 75 per cent return-load requirement. Pipe lines enjoy the exemption provided for public utilities. However, ODT specifically states that trucks used in pipe-line construction are not exempt. Still the exemption for "special equipment" such as low-bed trucks, pole trailers or pipe dollies, and trucks primarily engaged in moving mounted machinery would take care of a considerable number of trucks used in pipe-line construction. "Special equipment" also includes trucks with "mounted tanks or tanks designed to carry bulk liquids." Trucks used in connection with meter reading and gaging are not exempt.

The object of the ODT truck regulations is to reduce the use of trucks by between 33⅓ and 40 per cent by promoting pooling arrangements by which trucks may be used most effectively. It has been found, for instance, that in some parts of the Southwest public carriers will leave a city with 20,000 tons of carrying capacity empty on an average day while private carriers will load out 20,000 to 30,000 tons of freight daily and return empty.

Already state barriers to truck movements have been eliminated by the reciprocal licensing arrangement which became effective June 1 when all states adopted uniform weight and size requirements specified by U. S. Bureau of Public Roads.

To meet the requirements of ODT orders in the oil-producing areas of the United States an oil field traffic pool has been organized. Common and contract carriers have been invited to join. A committee headed by W. O. Compton of T. E. Mercer Teaming & Trucking Contractor, Fort Worth, Tex., who serves as chairman, has prepared a plan which has been submitted to ODT for approval.

There has been some misunderstanding about the effective date of the regulations. Enforcement of rules calling for 75 per cent return load and those affecting tank trucks have been postponed until July 1. Since these rules presented major difficulties, many overlooked the fact that the remainder of the rules continued in force, including those forbidding overloading more than 20 per cent and those calling for a reduction of 25 per cent in total monthly mileage of rubber-tired vehicles engaged in local delivery service within a 25-mile zone, as well as rules calling for the avoidance of circuitous routes.

In the Southwest the details of the ODT regulations are being handled by representatives employed by ODT and by those representing associations. On March 31, the private carriers of Oklahoma elected W. H. Esser, Shell Oil Co., Inc., as chairman to represent them on the advisory committee for ODT in Oklahoma. The advisory council includes representatives of each group of carriers. A similar position is held in Texas by Oscar Lynch, Humble Oil & Refining Co. J. L. Burke, Stanolind Pipe Line Co., chairman of Shippers Oil Field Traffic Association, is concerned with the status of contract carriers.

Working under the direction of Joseph B. Eastman, director of ODT, John L. Rogers, division of motor transportation, has discussed the ODT regulations with operators in the Southwest. ODT truck regulations are administered in Oklahoma by W. W. Warren, state manager, Oklahoma City, Okla., and in Kansas by W. R. Bartling, state manager, Wichita, Kans.

Twenty-Fifth Birthday Sees Phillips Still Expanding

ON June 13 Phillips Petroleum Co. of Bartlesville, Okla., celebrates the twenty-fifth anniversary of its organization. Frank Phillips, founder and present chairman of the board, in referring to this occasion, said: "It is not the past but the future which is at stake today. This applies to both our company and the whole world. Twenty-five years is not long in the life span of great companies. So far we have only built a foundation; upon this we will build an even greater company in the future."

Thus, Frank Phillips projects himself and his associates into the future as he has always done during the quarter century in which his organization has grown from a small $3,000,000 producing company to one of the country's largest oil concerns with net assets of more than $240,000,000.

Born in the war days of 1917, the Phillips company now finds itself an important cog in the machine of another war period. Today its 25 years of experience, and its millions of dollars invested in research are being enlisted in the nation's service.

No story of Phillips would be complete without a reference to the personal history of Frank Phillips, who has led his organization to its present position.

Typical Farm Boy

Born November 28, 1873, at Scotia, Neb., Mr. Phillips' early boyhood was typical of farm life in that period. When he was less than a year old his family moved to a farm near Creston, Iowa, where young Phillips attended country school. When he was 14 he got his first "regular" job in a Creston barber shop and by the time he was 24, Frank Phillips had become proprietor of his own shop in Creston. Two years later Mr. Phillips was offered a job selling bonds and he did not hesitate to dispose of his barber shop and take advantage of the wider opportunities.

Frank Phillips enjoying one of his few moments of relaxation at his ranch near Bartlesville

From its inception, the company recognized that in addition to the production of crude oil there were advantageous possibilities in the liquid vapors contained in natural gas. These vapors were then being partly saved, but through inefficient methods, to yield a product known as casinghead or natural gasoline. Under war conditions of 1917 there was an active demand for all types of motor fuel, and a wide use of natural gasoline for blending with ordinary gasoline.

Starting with one small gasoline plant, the company added plants until it became the largest producer of natural gasoline in the country, a position that it holds to this day.

In 1927 the company decided to embark on a major program of integration. It was producing quantities of natural gasoline which the research department had demonstrated to its own satisfaction could be successfully used as a blending agent in the manufacture of automobile and aviation gasoline. Frank Phillips believed that the time had come to add refining, transportation and marketing to the company's producing activities.

As the first step in this program, the company bought the Alamo refinery at Borger, Tex. Later, in 1930, it acquired the Independent Oil & Gas Co., which, in addition to wide interests in various phases of the oil industry, owned a refinery at Okmulgee, Okla., and another at Kansas City, Kans.

From the beginning of the company's marketing history it has stressed economical distribution of products, and in 1930 started the construction of a 736-mile pipe line from Borger, Tex., to East St. Louis, Mo.,, the first long-distance line to be built solely for the transportation of gasoline and other light products. This was the first "closed" system to be built by any oil company and included several features never before used. Later a branch of the main line was run from Paola, Kans., to the Phillips refinery at Kansas City, and a transfer connection later led into the Great Lakes Pipe Line built under joint ownership of six companies, of which Phillips was one, to provide gasoline transportation from Oklahoma

This group witnessed completion of a Phillips well in 1923. Top row: A. W. Lefeber, vice president, Midland Valley Railway Co.; E. E. Dardis, roustabout; H. Dewoody, American Glycerin Co.; E. E. Cribley, foreman; R. H. Higgins and Russell Armstrong, New York; L. E. Phillips, vice president and general manager; H. A. Trower, traffic and sales manager; E. P. Earle, Nipissing Mines; J. P. Braymer, district superintendent; A. H. Riney, chief engineer; F. S. Gleason, superintendent gasoline-plant operations; J. H. Kane, vice president and general counsel; R. P. Brewer and E. E. DuPont, directors; W. T. Noland, Oklahoma superintendent, and F. E. Rice, consulting engineer. Lower row: C. E. Klein, district foreman; J. S. Dewar, assistant general superintendent; Clyde Alexander, vice president and general superintendent; H. E. Koopman, secretary and treasurer; J. L. Johnston, director; K. E. Beall, department of economics; F. P. Neal, director; J. M. Sands, consulting geologist; Charles Lemp, director; Frank Phillips, president; John Phillips, director, and M. R. Puckett, president, Maire Hotel Co.

to Iowa, Nebraska, Minnesota, and east to Chicago. Phillips' gasoline pipe line was extended in 1939 from East St. Louis to East Chicago, where a marine terminal provides for the transfer of products to lake barges which deliver to points on the Great Lakes. The Borger-Chicago system has a total length of 1,071 miles, and carries more than 45,000 bbl. of products daily.

Much of the success of Phillips integration program has been due to its research activities, which began in 1923. A research department was established in 1925, and its first job was concerned with finding methods of stabilizing natural gasoline and discovering means of utilizing byproducts then regarded as waste. Natural gasoline was analyzed and analytical methods were developed that have since been adopted throughout the industry. The work accomplished by the research department provided an early basic knowledge and experience which was later to prove valuable in contacting the problems of aviation gasoline, synthetic rubber, toluene, catalytic cracking, and the many other new uses for petroleum brought about by war. When the United States first undertook its program of national defense, Phillips' research division was prepared to contribute constructively and substantially to the national effort. Very little change was necessary to turn from peacetime research activities to those of war.

Contracts Two New Plants

The most recent development in Phillips' wartime activities has been its announcement of contracts for two new plants to be designed, built, and operated by Phillips but owned by the Government. These plants will manufacture butadiene and styrene, the two chief ingredients of the most important type of synthetic rubber for the manufacture of automobile tires.

In 1937, after 21 years of service as directing head of the company, Frank Phillips felt that he was ready to relinquish some of his responsibilities. He had a successor ready trained, a man who had come up through the ranks of the Phillips organization and was thoroughly familiar with all its operations. Therefore, in 1938, Frank Phillips became chairman and K. S. Adams, at the age of 39, became president of the company.

"Boots" Adams started working for the company in 1920 as a warehouse clerk. A former basketball player at Kansas University, he was organizer and star player on the first Phillips team. After working his way through various departments, he was appointed assistant secretary in 1927, and the following year was made assistant treasurer. In August 1932 he became assistant to the president, and on April 30, 1935, was elected a member of the board and the executive committee. On the same date, he was appointed treasurer of the company, but retained, in addition, his position as assistant to the president. Effective January 1, 1938, Mr. Adams was elected executive vice president, and a few months later on April 26, 1938, he advanced to the presidency, probably the youngest man to become chief executive of a major oil company.

●

Eastern Suppliers Urged To Draw on Nearest Stocks

WASHINGTON, D. C.—The Office of Petroleum Coordinator is urging oil suppliers to increase further the movement of tank cars in East Coast service by obtaining their stocks from available supplies nearest to the point of use.

An amendment to a formal recommendation No. 12 calls upon suppliers who import petroleum and petroleum products into District 1 to fill their requirements by shipping the oil or products "from that point where there is available a supply . . . involving the shortest haul."

Natural Gas and Gasoline Division of OPC Organized

WASHINGTON, D. C.—Organization has now been virtually completed of the new Natural Gas and Natural Gasoline Division of the Office of Petroleum Coordinator.

Director of the division is E. Holley Poe, who resigned as secretary of the Natural Gas Division of the American Gas Association to accept the position. Assistant director is Paul Raigorodsky, formerly assistant director of the production division and formerly with the Petroleum Engineering, Inc. Others on the staff of the new division who were transferred from the production division include R. W. Ducker, formerly with the Oklahoma Natural Gas Co., chief of the natural-gas section; James E. Pew, formerly with the Virginia Gasoline & Oil Co., chief of the natural-gasoline section; J. Woodward Martin, formerly with the Lone Star Gas Co., and Thomas R. Weymouth, formerly with the Columbia Gas & Electric Corp.

Picture and biographical sketch of E. Holley Poe, director of the Natural Gas and Natural Gasoline Division, appear on Page 89 of this issue.

Deputy Coordinator Ralph K. Davies said that the new division would "function on the same level with other operating divisions of this office."

"The division," he said, "will concern itself with all of the problems involved in the production of natural gas, the production and manufacture of natural gasoline, and the associated hydrocarbons used in the manufacture of war products.

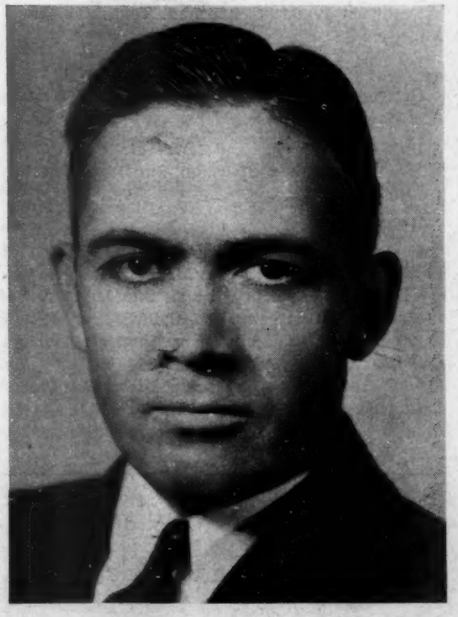
"It must concern itself with formulating, in cooperation with the industry, plans and programs designed to assure the discovery and production of an adequate quantity of natural gas and natural gasoline. In so doing, it must be continually mindful of the need for carrying forward these activities with the minimum use of scarce materials."

Upon assuming his new post, Mr. Poe stated that every effort will be made to work with the industry in an over-all effort to assure the maintenance of adequate transportation and distribution facilities. He expressed confidence that the natural-gas and natural-gasoline industries "will give us full cooperation."

Paul M. Raigorodsky, Tulsa, assistant director of the new Natural Gas and Natural Gasoline Division of OPC

"Every segment of the petroleum industry is interdependent upon the other," Mr. Poe declared. "We shall do our utmost to integrate our efforts with those of the other divisions, and to cooperate with other federal agencies that are interested in transportation and distribution problems.

"The natural-gas and natural-gasoline industries play an important part in the war program. They produce the essential components of such products as 100-octane aviation gasoline, synthetic rubber, and toluene."



Robert W. Ducker, formerly superintendent of Oklahoma Natural Gas Co., Tulsa, head of the natural-gas section

●

I.P.A.A. Executive Committee Called to Meeting June 15

The executive committee of the Independent Petroleum Association of America will meet June 15 at the Biltmore Hotel, Oklahoma City, Okla., for a discussion of several important questions that have developed within the past few weeks.

One matter to be placed before the 17-man committee are the bills introduced in Congress providing for organization of the War Petroleum Corp., which would be authorized to make loans to oil companies, purchase petroleum for storage or sale and extend other forms of financial assistance to the industry.

Committeemen will also discuss details of the association's annual meeting scheduled for October 21-22 at Wichita, Kans.

Petroleum Industry War Council at Work

(Continued from Page 19)

J. F. Drake; W. F. Humphrey.

Standing committee on petroleum economics—Dr. Robert E. Wilson, chairman; W. S. Farish; W. H. Ferguson; A. Jacobsen; Dr. John D. Gill; A. C. Mattei; J. Howard Pew, and Charles F. Roeser.

Standing committee on protection of petroleum industry facilities—William S. Farish, chairman; Frank Buttram; H. D. Collier; Henry M. Dawes; J. Frank Drake; W. H. Ferguson; C. L. Henderson; George A. Hill, Jr.; Dana Hogan; J. C. Hunter; B. L. Majewski; M. C. McGowen; J. Howard Pew; W. S. S. Rodgers; E. G. Seubert; N. H. Weber; W. G. Skelly, and David V. Stroop, secretary.

Committee on cost and price adjustment—Dr. John D. Gill, chairman; John A. Brown; William H. Ferguson; William F. Humphrey; Frank Phillips, and Charles F. Roeser.

Subcommittees of the PIWC are as follows:

Subcommittee on lubrication and containers—

H. J. Kennedy, Continental Oil Co., Ponca City, Okla.

F. C. Kerns, Texas Co., New York.

J. M. Koch, Quaker State Oil Refining Corp., Oil City, Pa.

H. D. Miller, Shell Oil Co., Inc., New Orleans, La.

C. B. Prescott, Gulf Oil Corp., New Orleans, La.

H. G. Vesper, Standard Oil Co. of California, San Francisco, Calif.

L. C. Welch, Standard Oil Co. (Indiana), Chicago.

E. W. Yeates, Wasatch Oil Refining Co., Salt Lake City, Utah.

Subcommittee on equipment—

C. C. Benedict, chairman, Socony-Vacuum Oil Co., Inc., New York.

B. E. Devere, Pathfinder Petroleum Co., Los Angeles, Calif.

John Lang, Lang Co., Salt Lake City, Utah.

William K. Tell, Standard Oil Co. (Indiana), Chicago.

Dan O'Connell, Texas Co., Houston, Tex.

Subcommittee on product conservation—

B. I. Graves, chairman, Tide Water Associated Oil Co., New York.

J. E. Dyer, secretary, 712 Chanin Building, New York.

W. H. Kershaw, Texas Co., New York.

J. A. Miller, Standard Oil Co. (New Jersey), New York.

Temporary pipe-line engineering subcommittee—

W. R. Finney, chairman, Standard Oil Co. of New Jersey, New York.

G. J. Hanks, vice president, Tide Water Associated Oil Co., New York.

T. E. Swigart, president, Shell Pipe Line Corp., Houston, Tex.

C. H. Kountz, vice president, Sinclair Refining Co., Independence, Kans.

Charles Bunje, Jr., president, Illinois Pipe Line Co., Findlay, Ohio.

B. E. Hull, president, Texas Pipe Line Co., Houston, Tex.

Subcommittee on petroleum economics—

Stewart P. Coleman, chairman, Standard Oil Co. (New Jersey), New York.

Harold B. Fell, Independent Petroleum Association of America, Tulsa.

R. G. Gonzalez, Humble Oil & Refining Co., Houston, Tex.

E. T. Knight, Atlantic Refining Co., Philadelphia, Pa.

Clarel B. Mapes, Mid-Continent Oil and Gas Association, Tulsa.

J. M. Sands, Phillips Petroleum Co., Bartlesville, Okla.

Sidney V. Swensrud, Standard Oil Co. (Ohio), Cleveland, Ohio.

Fred Van Covern, secretary, 50 West Fiftieth Street, New York.

Earl Wagy, Standard Oil Co. of California, San Francisco, Calif.

Subcommittee on lubrication and containers—

L. P. Lochridge, chairman, Sinclair Refining Co., New York.

K. C. Baker, J. D. Streett & Co., St. Louis, Mo.

Dr. C. C Buchler, Standard Oil Co. (Indiana), Casper, Wyo.

D. P. Clark, Gulf Oil Corp., Pittsburgh, Pa.

C. M. Davidson, Standard Oil Co. (New Jersey), New York.

J. M. Evans, Tide Water Associated Oil Co., San Francisco, Calif.

Wm. H. Henszey, Refiners Marketing Co., Los Angeles, Calif.

Chairmen and vice chairmen of the subcommittees of the committee on protection of petroleum facilities are:

Northeastern region.—E. H. Barlow, chairman, and R. W. Black, vice chairman, Standard Oil Co. (New Jersey), Elizabeth, N. J.

Southeastern region.—Wiley Moore, chairman, Wofford Oil Co., Atlanta, Ga., and H. A. Grumann, vice chairman, Sinclair Refining Co., Atlanta, Ga.

Great Lakes region.—L. S. Wescoat, chairman, Pure Oil Co., Chicago, and P. L. Krauel, vice chairman, Standard Oil Co. (Indiana), Whiting, Ind.

Central region.—John C. Day, chairman, Western Petroleum Refiners Association, Tulsa, and Phillip Campbell, vice chairman, Port Arthur, Tex.

Subcommittees

Gulf Coast refinery:

Frank L. Wallace, chairman, Texas Co., Houston, Tex.

Gulf Coast production:

George Sawtelle, chairman, Kirby Petroleum Co., Houston, Tex.

Gulf Coast storage and terminal:

W. C. Kinsolving, chairman, Sun Pipe Line Co., Beaumont, Tex.

Western region:

H. D. Collier, chairman, Standard Oil Co. of California, San Francisco, Calif.

J. L. Hanna, vice chairman, Standard Oil Co. of California, San Francisco, Calif.

Dana Hogan, vice chairman, Hogan Petroleum Co., Los Angeles, Calif.

A. C. Rubel, vice chairman, Union Oil Co. of California, Los Angeles, Calif.

•

Oil Development of Canadian Northwest To Be Accelerated

(Continued from Page 15)

from Alaska and Siberia, the Alaska Highway is taking on added importance.

The two western routes lie within the mountains and owe their comparative continuity from one river system to another to the way in which streams cut their way downward. In any mountainous area there are two principal directions of flow, one along soft beds parallel to the trend of the mountains and the other down the slopes of the mountains themselves. Owing to the steeper gradient of the latter group, they are able to cut deeply into the mountains and tap the parallel streams. Sometimes one of these streams will tap a longitudinal river at a point where it can turn it around. Thus the longitudinal valleys do not have any high divide between the headwaters of the various streams as the divides themselves may have been crossed at one time by rivers.

The western route makes use of the valleys cut by the Skeena, Nass, Stikine, and Taku rivers and the headwaters of the Yukon itself. Ladue Creek lies near the headwaters of the Tanana. By utilizing the highway down the Yukon from Whitehorse, this route requires the smallest amount of construction of the three and is, moreover, the shortest. This advantage is offset by the heavy precipitation particularly during the winter, the lack of landing fields, the poor communications between Hazleton and the East and comparative vulnerability.

The central route is considerably more accessible as a number of main lines from the United States and Canada east of the Rockies converge upon Edmonton from which a railroad and a highway extend nearly to Fort St. John. From this point, the route follows large river valleys to the Pelly River. There is a recent agricultural development of considerable proportions in the Peace River district and this area can supply provisions for use along the highway, saving in transportation. The Peace River is navigable so that it can provide a feeder route for many commodities, and the railway system from McMurray will provide a means of transporting road material. The rivers are, of course, open for only a few months in the summer.

The interior route, from Peace River is longer than the other three and is only slightly more accessible at the southern end than the route through Fort St. John. It affords additional advantages in that it traverses flatter country, permitting the construction of airports at many places and it also passes closer to potential oil supplies which, it is hoped, will make the district self sustaining in the matter of oil and petroleum products.

Construction of the highway is reported to have started although its exact route as well as its termini are, naturally, not being made public. General knowledge of the area suggests, that the term "Alaskan Burma Road" is a misnomer. Yellowhead Pass, through which passes the Canadian National Railways main line from Edmonton to the coast, has an elevation of only 3,700 ft. The elevation of Edmonton is only 2,100 ft. which is considerably lower than cities occupying a comparable situation with respect to the Rockies in the United States. The elevation of Hazleton and of Peace River is under 1,200 ft. Where the Peace River cuts through the Rockies west of Hudson Hope, the elevation is only 2,000 ft. and the headwaters of the Peace River are only 2,500 ft. above sea level.

This indicates that throughout the area to be traversed by the highway, no matter which route it follows, the course will not be a tortuous one clinging to the sides of cliffs, as does the Burma Road. Nor is the area traversed the "Frozen North" as is indicated by the excellent crops grown in the Peace River Valley near one end and the Matanuska Valley near the other. Outside of its present military usefulness, the highway will open to colonization and development a new frontier of great potentiality.

Natural Gas News

Hope Natural's Rates Reduced $3,609,857 Annually By Power Commission's Decision

WASHINGTON, D. C.—Hope Natural Gas Co. of West Virginia has been ordered by the Federal Power Commission to reduce its interstate wholesale rates for natural gas sold to Ohio and Pennsylvania distributors by $3,609,857 annually.

The new rates ordered by F.P.C. will reduce natural-gas costs to East Ohio Gas Co. by $2,820,000 annually, to Peoples Natural Gas Co., by $682,000 annually, to Manufacturers Light & Heat Co., by $70,000 annually, and to Fayette County Gas Co., by $28,000 annually. Reductions ordered on a basis of charges per 1,000 cu. ft. were: East Ohio Gas, from 36.5 to 29.5 cents; Peoples Natural Gas Co., from 35.5 to 28.5; Manufacturers Light & Heat and Fayette County Gas Co., from 31.5 to 28.5 cents.

Legitimate Cost Factor Used

Utilizing the "actual legitimate cost" method, provided for in the Natural Gas Act, the majority opinion slashed the company's claimed interstate rate base of $66,000,000, described in the opinion as "molded from an estimate of the cost to reproduce the property less observed depreciation, plus working capital," to $33,712,526 for the future and found 6.5 per cent to be the fair rate of return. In rejecting as "unreasonable" Hope's contention that it should be allowed a rate of return of not less than 8 per cent, the opinion points out that "during the 42 years of its history, to 1941, Hope has earned on its owners' equity an annual average profit of 12 per cent and, in addition, has built up through annual provisions charged to expense, depletion, and depreciation reserves far in excess of requirements.

The opinion points out that during the proceeding the Hope company submitted, through the use of three different methods, figures of $97,000,000, $105,000,000, and $70,000,000 as the cost of its properties. The $97,000,000 figure, which represents the company's estimate of the cost to reproduce its property, is analyzed and dismissed by the commission with the statement that "it is not predicated upon facts and . . . is to conjectural and illusory to be given any weight in these proceedings." Similarly, the $105,000,000 figure, which was obtained through a method termed by the company as "trended original cost," is rejected by the commission with the conclusion that "it is basically erroneous and produces irrational results." Both the reproduction cost studies and the "trended original cost" figures were termed as "the typical, hypothetical conjectures which have plagued rate regulation for more than 40 years."

Cost-of-Plant Claim Reduced

The $70,000,000 figure, claimed by the company to be the original cost of its properties, is approximately $17,000,000 higher than the cost of plant as shown by the company's books as of December 31, 1938. The commission's allowance for cost of plant as of December 31, 1938, is $51,207,621 and for the future (i.e., subsequent to the end of 1940) is $51,957,416, a reduction of about $17,800,000 in the company's claimed costs.

The opinion notes that during its existence, the Hope company has paid more than $108,000,000 in dividends to its parent company, Standard Oil Co. (New Jersey).

Interstate Hearing Date and Location Changed by FPC

WASHINGTON, D. C.—The consolidated proceedings involving a petition filed by the Louisiana Public Service Commission for an inquiry into the rates of the Interstate Natural Gas Co., Inc., and an investigation of the Interstate company's wholesale rates has been postponed from June 15 to June 17. The place of hearing has been changed from Baton Rouge to the Hotel Roosevelt in New Orleans, the Federal Power Commission announced.

Charging that Interstate's natural-gas rates and transportation charges to other public utilities and municipalities are unjust and unreasonable, the Louisiana commission's complaint requested that Interstate be ordered by the FPC to show cause why such rates should not be reduced, and that "an order be entered setting fair, reasonable and just rates for the transportation or sale of natural gas in interstate commerce by Interstate to other public utilities and municipalities in Louisiana."

Recycling News

Four Companies to Build Large Plant in Louisiana

BATON ROUGE, La.—Four major oil companies with properties in the Erath field, Vermilion Parish, Louisiana, have arranged to start construction of one of the largest recycling plants in the state. High preference ratings are reported to have been granted for the project which will recover several basic products useful in manufacturing war materials.

Companies sharing in the project include Humble Oil & Refining Co., Texas Co., Phillips Petroleum Co., and Tide Water Associated Oil Co.

Natural Gasoline

California Liquefied Petroleum Gas Demand Increases 50 Per Cent During First Quarter

LOS ANGELES, Calif.—Demand for liquefied petroleum gas in California has increased more than 50 per cent during the first few months of this year, the Bureau of Mines reported here last week. Final figures on operations of the liquefied petroleum gas industry for 1941 were reported at the same time showing that sales reached a new high record last year of 102,885,000 gal., exclusive of exports.

The 50 per cent increase in the first 3 months of 1942, compared with the same quarter last year, is all the more significant because of the record demand in 1941 and because of the transportation difficulties and equipment restrictions against which operations have worked this year.

The increase in sales in 1941 over 1940 amounted to approximately 42 per cent, compared with the 50 per cent increase in 1940 over 1939, but the volume gain in 1941 was considerably higher than in 1940, 30,288,000 gal. compared with 24,100,000 gal. The largest percentage gain, 54 per cent, occurred in propane, which is logical because of the diversion of butane to oil-refinery usage. Nevertheless, butane sales increased 42 per cent and sales of propane-butane mixtures increased 39 per cent.

Perhaps the most interesting change in demand revealed by the 1941 data is the relatively small increase in internal-combustion engine usage. Such sales during each of the last 4 years were: 1938—16,768,000 gal.; 1939—24,048,000 gal.; 1940—39,135,000 gal. and 1941—42,417,000 gal. Softening of the gasoline market and some question as to the continued availability of butane may have retarded the expansion of internal-combustion engine demand, partly nullifying the effect of increased business activity.

At least nine Army camps in the Pacific Coast territory are using liquefied petroleum gases for cooking and heating. Some of these camps can accommodate as many as 30,000 men and consume appreciable quantities of fuel, as indicated by the large increase in sales reported as "all other uses," in which government sales are included. This item increased from 489,000 gal. in 1940 to 6,997,000 gal. in 1941.

The data contained in this report do not include, because they are not sold as such, liquefied gases used directly by the producers for fuel, polymerization, solvents, dewaxing, blending with gasoline or as a raw material in chemical plants which are operated by liquefied-gas producers.

LIQUEFIED PETROLEUM GAS SALES IN CALIFORNIA—1941 AND 1940*

(Thousands of gallons)

Uses—	Propane		Propane-butane		Butane		Total	
	1941	1940	1941	1940	1941	1940	1941	1940
Domestic	10,432	8,293	17,899	9,570	6,666	4,556	34,997	22,419
Gas manufacturing	25	.....	3,509	2,774	7,039	5,524	10,573	8,298
Industrial fuel	1,220	510	3,903	1,560	2,778	186	7,901	2,256
Internal-combustion engine fuel	.....	285	32,713	30,930	9,704	7,920	42,417	39,135
All other uses	2,329	.....	4,227	.....	441	489	6,997	489
Total	14,006	9,088	62,251	44,834	26,628	18,675	102,885	72,597

*Bureau of Mines data.

Interstate Oil Compact Commission Meet at Lexington, Ky.

OKLAHOMA CITY, Okla.—Secondary recovery and pressure maintenance, means by which vast oil reserves may be recovered with minimum use of steel, will be studied at the summer quarterly meeting of the Interstate Oil Compact Commission in Lexington, Ky., June 19-20, according to Charles L. Orr, secretary.

While war shortages of steel have placed new emphasis upon secondary-recovery programs, the first national survey of all aspects of the subject will be made at the Lexington meeting of the compact.

Each of the commission's standing committees has chosen one phase of secondary recovery for study and report. Individual reports from the oil states will be gathered into a national survey during committee meetings June 19, and the whole picture will be presented the following day at the general session.

Accepted and approved engineering principles will be discussed and reported by the engineering committee. Legal aspects and principles of secondary recovery, repressuring and recycling will be reported by the legal committee. The research and coordinating committee will present factual and technical data and make a nation-wide survey on secondary-recovery projects. State rules and regulations will be surveyed and reported by the regulatory practices committee.

Meeting place for the summer session of the compact was set when Gov. Leon S. Phillips of Oklahoma, commission chairman, received an invitation from Gov. Keen Johnson of Kentucky, who only 3 months ago signed the document that made Kentucky the twelfth member of the compact.

Kentucky lies in the heart of America's greatest secondary-recovery area and like that of neighboring Ohio, Pennsylvania, West Virginia and Indiana, her production is largely by secondary methods.

No other compact meeting has been held so far east, and compact officials are expecting a large attendance by operators and public officials of Kentucky, Ohio, Pennsylvania, Indiana, Tennessee and West Virginia.

A.S.M.E. Will Hold Two Meetings Next Week

The American Society of Mechanical Engineers has two meetings scheduled for next week, which will be of interest to men in the oil industry. The first of these will be the fifteenth National Oil and Gas Power Conference, which will be held at Peoria, Ill., June 17-19, with the Society of Automotive Engineers cooperating. The second will be the ninth national meeting of the Applied Mechanics Division, and will be held at Massachusetts Institute of Technology, Cambridge, Mass., June 19-20.

The Peoria meeting will include a session on engine design, a session on power plants, a round table on operation and maintenance under wartime conditions, a symposium on engines and combustion, and a tour of the proving grounds of Caterpillar Tractor Co.

The M.I.T. meeting will feature sessions on equilibrium and dynamics, and elasticity.

W.P.R.A. Will Hold Technical Meeting in Shreveport

A symposium on specifications will feature the meeting of the technical group of the Western Petroleum Refiners Association in Shreveport, La., Friday, June 12. Meeting place will be the Washington-Youree Hotel, and starting time 4 p.m.

Continuing its effort to bring to refiners information on developments in the world of petroleum caused by the war emergency, it is felt by officials of the association that an interchange of ideas on, and a thorough discussion of the vital subject of specification is especially timely.

The symposium will be presented in three parts, the first, dealing with gasoline specifications, by A. W. Trusty, chief chemist of Arkansas Fuel Oil Co.; the second, dealing with lubricant specifications, by H. J. Sheard, superintendent of Bayou State Oil Corp.; and the third, dealing with fuel-oil specifications, by W. M. Carney, chief chemist of Lion Oil Refining Co. There will be an open forum to give all present an opportunity to participate in the discussion. Chairman of the meeting will be J. K. MacKinnon, general manager of Talco Asphalt & Refining Co.

CONDENSED DIRECTORY OF THE OFFICE OF PETROLEUM COORDINATOR

Interior Department (New Building) 18th and C Sts., N.W. Phone Republic 1820

Coordinator.—Harold L. Ickes, room 6156, extension 500.

Deputy Coordinator.—Ralph K. Davies, room 6654, extension 3831-2.

Assistant Deputy Coordinator.—Robert E. Allen, room 6647, extension 4645.

Production Division.—D. R. Knowlton, director, room 7410, extension 4861.

Refining Division.—Wright W. Gary, director, room 6637, extension 3253.

Transportation Division.—J. R. Parten, director, room 6629, extension 4418.

Natural Gas and Natural Gasoline Division.—E. Holley Poe, director, room 7423, extension 4860.

Research and Planning Division.—Edward B. Swanson, director, room 7315, extension 649.

Conservation Division.—Everett L. De Golyer, director, room 7516, extension 4459.

Materials Division.—William F. Huff, director, room 7314, extension 4585.

Petroleum Supply Division.—Robert L. Minckler, director, room 7452, extension 4834.

Legal Division.—J. Howard Marshall, chief counsel, room 6649, extension 4100.

Marketing Division.—John W. Frey, director, room 4256, extension 4646.

War Production Board Consultant on Priorities.—O. A. Davis, acting chief, room 7340, extension 4616.

Executive Officer.—Stanley W. Crosthwait, room 6415, extension 4363.

Information Division.—Herbert A. Yocom, director, room 7513, extension 3844.

Foreign Division.—James T. Duce, director, room 4442, extension 4417.

Liaison.—Brig. Gen. Walter B. Pyron, liaison agent between War Department and OPC. Phone Republic 6700, extension 6044, room 6261, new War Dept. Bldg.

Tanker Coordinating Board.—Ralph K. Davies, chairman, room 6654, extension 3831-2.

Receptionist.—Mrs. Rosalie E. Reid, room 6635, extension 3429.

WAR PRODUCTION BOARD

Social Security Building, Fourth and Independence Ave., S.W. Phone Republic 7500

Division of Civilian Supply (Temporary Building D).—Leon Henderson, director, room 46, extension 5586.

Petroleum Unit (Temporary Building R).—W. G. Shallcross, business specialist, room 1709, extension 3722.

Bureau of Industry Branches.—Philip D. Reed, director, room 5420, extension 3394.

Petroleum Machinery and Equipment Section (Temporary Building, East, Seventh Wing, Third Floor).—A. E. Collins, chief, extension 5741.

Liaison With Office of the Petroleum Coordinator and Reconstruction Finance Corp.—R. O. McClintock, room 5193-A, extension 71181.

OFFICE OF PRICE ADMINISTRATOR

Temporary Building D

Administrator.—Leon Henderson, room 46, extension 5586.

Assistant Administrator.—George W. Stocking, in charge of fuels.

Fuels Section.—George Doffing, price executive, room 236, extension 5388.

Petroleum Unit.—Joseph Salmon, chief, room 2703, extension 6376.

Director of Gasoline Rationing (Temporary Building S).—Joel Dean, room 1048, extension 71322.

Oil-Field Equipment (La Salle Building).—U. R. Laves, room 3060, extension 5167.

DISTRICT OPC OFFICES

DISTRICT 1
122 East Forty-second St., Chanin Bldg., New York City

DISTRICT 2
120 South La Salle St. Bldg., Chicago, Ill.

DISTRICT 3
245 Mellie Esperson Bldg., Houston, Tex.

DISTRICT 4
320 First National Bank Bldg., Denver, Colo.

DISTRICT 5
417 S. Hill St., 855 Subway Terminal Bldg., Los Angeles, Calif.

DEATHS

N. H. REARDON, 68, general superintendent in the Jacksonburg area of West Virginia for E. H. Jennings Brothers, Pittsburgh, Pa., died June 7. He had spent 52 years in the service of the company.

WILBUR JAMES CRITES, 59, engineer in the production department of Phillips Petroleum Co., died in a Bartlesville, Okla., hospital last week after an illness of 3 weeks. Mr. Crites had lived in Oklahoma for 33 years. He is survived by his widow and two sons.

ALEXANDER CUNNINGHAM, SR., 69, retired employe of Quaker State Refining Co., died last week at his home in Smethport, Pa., from a heart attack. His widow, a daughter and two sons survive.

WILLIAM C. McGLOTHLIN, 47, oil operator and civic leader of Corsicana, Tex., died in that city last week. Mr. McGlothlin was credited with the discovery of the Camp County pool in 1940.

ARNOLD I. SELLARS, 47, field superintendent in the gasoline department of Skelly Oil Co., died suddenly at his home in Tulsa, Sunday. He is survived by his widow, two sons and a daughter.

HARRY LEE WESTBROOK, 79, for the past 17 years director and treasurer of the California Oil and Gas Association, and former president of Midway Peerless Oil Co., died at a Los Angeles, Calif., hospital, last week. He leaves his widow and a daughter.

JOHN T. JAYNES, oil operator of Wichita, Kans., died in a Wichita hospital Sunday after a long illness. Mr. Jaynes was born in Waco, Tex., but had lived in Wichita for 25 years. He is survived by his widow and a son.

JAMES CLARENCE DENTON, 60, vice president and general counsel of Mid-Continent Petroleum Corp., Tulsa, died at his home in Tulsa last week, following an illness of several months. Mr. Denton came to Tulsa in 1916 to join the legal staff of Cosden, becoming general counsel in 1921. His election as vice president came in 1925. Earlier in his career, he was a professional baseball player, and served for 12 years as mayor of Nowata, Okla. He is survived by his widow and a son.

ENGINEERING *and Operating* SECTION

Drill-Pipe Inspection as Basis for Improving Drilling Technique

By T. P. SANDERS

Maintenance for Victory

Practice in past years has been to operate drill pipe until an increase in the number of fishing jobs indicated the string was no longer safe. Recently, a method of inspecting drill pipe has greatly reduced the number of failures and has allowed drilling crews to keep operating old pipe with a justified feeling of safety. The information obtained while inspecting the pipe has led to a classification of defects by causes: often slight changes in the method of operation of the rig will eliminate the factors contributing to the short life of the drill pipe.

PERIODIC visual analysis of their drill strings has caused several progressive Mid-Continent drilling firms to alter materially their drilling technique. Certain common practices were found to be detrimental to drill-pipe life when studied in the light of knowledge gained by internal inspection of the pipe. These practices are now avoided.

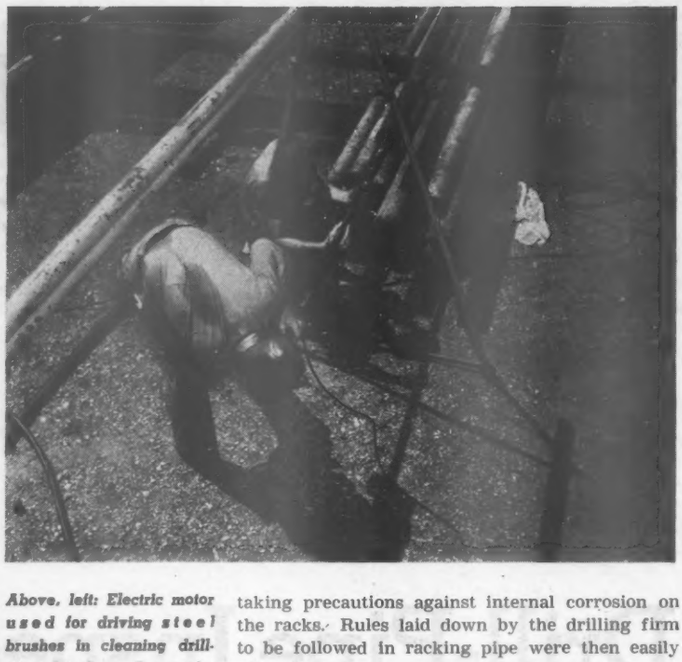
As originally conceived, the internal inspection of drill pipe provided a systematic method for eliminating defective drill-pipe joints before they could cause fishing jobs or loss of the hole through failure in service. Careful study of a great number of strings, however, made it possible to recognize all types of abnormal drill-pipe deterioration. Correlation of this accumulated information with certain direct field observations of drilling conditions and technique led to the ability to define quite accurately the cause or causes of any disruptive condition found in the pipe.

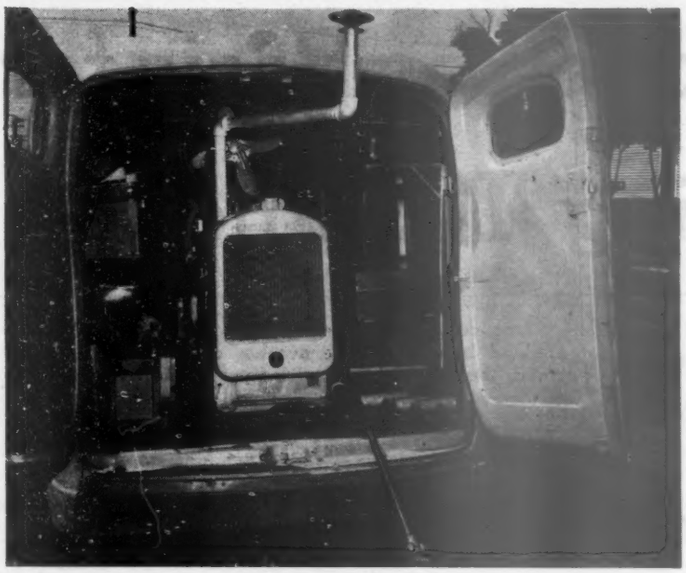
Stated otherwise, it can be said that the results of any given drilling technique, in so far as it affects drill-pipe life, can be read in the pipe interior. While this is not a positive gage, it is probably the best means available today for evaluating the subsurface results of forces applied to the drill stem.

Most drilling supervisors are now constantly on the alert for reliable clues that will guide them in overcoming their drill-pipe troubles. As users of the now-precious steel supply of the nation they recognize their inherent disadvantage that comes with not being able to see the working conditions under which their drill pipe is being consumed. For this reason they must rely largely on surface studies of their pipe for indications as to what practices are to be avoided.

A good example showing how visual study of drill pipe, inside and out, can be used as a guide

A mercury-vapor lamp illuminates the pipe interior so that the pipe defects can be studied under magnification





Above, left: Electric motor used for driving steel brushes in cleaning drill-pipe interior prior to inspection or spraying. Compressed air blows away the rust or mill scale as it is removed

Above, right: A close study of the defects found in the drill-pipe interior gives many indications as to how drilling practices can be improved to lengthen drill-pipe life

Left: Engine in servicing truck which drives an electric generator and an air compressor for cleaning and inspection operations

in revising drilling practice is found in the recent reports of a prominent Texas drilling firm. Operating in many West Texas fields, this contracting firm adopted the use of a regular drill-pipe inspection service as a means of weeding out the defective joints while obtaining maximum life from the good joints of each string. The supervisors soon recognized the fact that most of the joints in the lower portions of their strings were being discarded because of fatigue cracks.

Use More Drill Collars

Since the early days of rotary drilling this firm, like many others, had made it a practice to use part of the weight of the drill pipe to apply pressure to the bit. When drilling is carried on in this manner, the lower portion of the drill pipe is rather heavily loaded in compression while it is being rotated. Most drill pipe will support itself as a column without bending appreciably only in lengths less than 150 ft. In other words, if more than 200 ft. of the pipe is placed in compression, it will bend within the limits of the hole. Due to this bending, stress reversals will be brought about with each revolution of the drill stem. The presence of these stress reversals (alternating tension and compression forces) has been well known, but prior to the use of internal drill-pipe inspection there was no practical way in which their effects could be evaluated.

After noting how many drill-pipe joints had been discarded prematurely due to fatigue cracks that had developed because of stress reversals, the officials of the contracting firm ordered a complete change in drilling technique. Instead of using part of the drill-pipe weight for loading the bit, they inaugurated the modern practice whereby heavy drill collars are used to obtain the desired weight on the bit. Following this practice, the drill pipe serves only as a drive shaft, and its entire length is held in tension while it is being rotated. All stress reversals are avoided except at crooked points in the hole.

Results obtained from the improved drilling practice were so encouraging that the same firm further consulted its drill-pipe inspection data for guidance in overcoming other troubles. Joints had often been discarded due to corrosion, and the presence of longitudinal rows of corrosion pits along the inside surfaces of the joints showed that the corrosion had, in most cases, occurred on the pipe racks.

When pipe is stacked wet with salt water, or salty mud, severe corrosion takes place along the lower inside surface of each joint. Drillers and other workers, viewing for the first time the deep pits resulting from this type of mistreatment, were immediately impressed with the necessity of taking precautions against internal corrosion on the racks. Rules laid down by the drilling firm to be followed in racking pipe were then easily enforced.

If a string of drill pipe is to be racked for a very short period, it is considered sufficient preparation if each joint is washed down thoroughly with fresh water. But if the pipe is to remain on the rack for any indefinite period, the inside is sprayed with a special protective coating which will remain intact for 2 or more years. Application of this coating can be included as part of the inspection service.

The Internal-Inspection Instrument

The ingenious form of periscope used for internal inspection of drill pipe and other tubular goods makes use of a series of lenses. Carried at the end of the instrument is a 250-watt 150-volt mercury-vapor lamp for lighting the pipe interior. The observer can view two distinctly different types of image, depending on his manipulation of the instrument. The "annular" image, used for locating defects, takes in 6 or 7 in. of the pipe interior, and this is viewed under a magnification of 1.5. For studying individual defects in order to determine their magnitude or their cause, an angle mirror is brought into use. This makes it possible to obtain a 90° view directly into the pit or other defect under a magnification of 2.

Thorough cleaning of the pipe interior is of course necessary before a successful visual analysis can be undertaken. Power-driven steel brushes provide a rapid and thorough means of accomplishing this cleaning. All equipment needed for cleaning, inspecting and spraying the pipe interiors is carried in a service truck. Generating equipment that furnishes electricity for lighting the mercury-vapor lamp also supplies power for driving the cleaning brushes. The compressor that supplies compressed air to blow away the scale and rust as it is removed by the steel cleaning brushes is also utilized to operate the spray gun.

Because of the convenient arrangement of the equipment, time required for the work is not great. Drill pipe can be cleaned and inspected at the rate of 1,000 ft. to 1,500 ft. per day. This includes running an external caliper to see if outside wear has made any of the joints unsafe to use. While the speed of cleaning and inspection is affected somewhat by the condition of the pipe, it is not affected by size of the pipe. Cleaning and

(Continued on Page 37)

Development, Operation and Valuation of Oil and Gas Properties—Part 3

Flow of Homogeneous Fluids Through Radial Systems

By PARK J. JONES
Petroleum Engineer, The Texas Co., Fort Worth, Texas

This is the third in a series of articles by the author appearing in The Oil and Gas Journal on Development, Operation and Valuation of Oil and Gas Properties. Previous subjects discussed were "Effective Porosity, Specific Permeability and the Geometry of Spacing," in the issue of May 28 ,1942, and "Flow of Homogeneous Fluids Through Linear Systems," in the issue of June 4, 1942. Installment 4 will appear on June 18 and will be titled, "Water in Virgin Oil and Gas Pays."

1. *Flow of homogeneous liquids through radial systems.*—Flow in radial systems is through cross-sectional areas which are proportional to the distances from the center of the systems as, for example, from the axis of well bores. In radial systems of thickness h, the cross-sectional area at x feet from an axis is given by

$$A = 2\pi hx$$

and Darcy's law in engineering units for constant flux and uniform permeability may be written

$$\int_{P_B}^{P_R} dP = \frac{\mu Q}{1.127\,(2\pi hK)} \int_{r}^{R} \frac{dx}{x} \qquad (1)$$

For steady flow of homogeneous liquids this equation may be integrated between the lower limits r and P_B which correspond to the effective radius of a well bore and bottom-hole operating pressure and the upper limits R and P_R which correspond to the radial distance a liquid flows and the pressure at R. Upon integrating and substituting values, it may be verified that

$$Q = \frac{3.07\,hK\,\Delta P}{\mu \log R/r} \qquad (2)$$

which is Darcy's law for steady rates of radial flow of homogeneous liquids through media of uniform specific permeability,

Where:

Q = rate of flow in bbl./day
h = thickness through which Q flows, feet
K = specific permeability, darcys
R = radial distance along which Q flows, feet
r = effective radius of a well bore, feet
P_R = pressure at R which corresponds to reservoir pressure, p.s.i.
P_B = pressure corresponding to bottom-hole operating pressure, p.s.i.
$\Delta P = (P_R - P_B)$ = differential pressure across $(R - r)$, p.s.i.
μ = viscosity in centipoises
log is to base 10; $\log_e x = 2.3 \log_{10} x$

Example 1.—How much oil can be forced through a radial system under the following conditions:

R = 330 ft.; r = ¼ ft.; μ = 4 centipoises; K = 300 md.; ΔP = 200 p.s.i. In this example

$\log \frac{R}{r} = \log 1{,}320 = 3.12$, whence

$$\frac{Q}{h} = \frac{3.07 \times 0.3 \times 200}{4 \times 3.12} = 14.8 \text{ bbl./day/foot of}$$

thickness. The productivity in this example does not vary with the drawdown and is given by

$$I = \frac{14.8}{200} = 0.074 \text{ bbl./day/foot thickness/p.s.i.}$$

drawdown.

2. *Effect of spacing on rate of recovery and ultimate recovery.*—Other things being equal, the pressure at any point x feet distant from the axis of a well bore in a radial system of uniform permeability and flow of homogeneous liquids is proportional to the logarithm of the distance, that is

$$P_x \propto \log \frac{x}{r}$$

In terms of a 6-in. well-bore diameter and $P_x = 1$ for x = 330 ft., which corresponds to 10-acre spacing; the relative pressure at any point x feet from the axis of a well bore for a steady rate of flow is given by

$$P_x = \frac{\log 4x}{3.12} \qquad (1)$$

Curve 1 in Fig. 6 is a solution of Equation (3.2.1). This curve indicates that the pressure drop within 50 ft. of a 6-in. well bore is approximately 74 per cent of the total pressure drop over 330 ft. By doubling the distance of flow, that is, by changing from 10-acre spacing to 40-acre spacing, the increase in pressure required to maintain a given rate of flow is slightly less than 10 per cent rather than 100 per cent. These data are for radial flow of homogeneous liquids through media of uniform permeability.

For radial flow of gas-oil mixtures in a reservoir having no gas cap, water drive, and no advancement by capillary action of displacing water, the permeability to oil of the media in the neighborhood of a well at a given time may be as low as one-third of the permeability to oil at the midpoint between wells. The decrease in permeability is caused by the evolution of solution gas upon reduction of pressure. A rough approximation of the pressure distribution, at a given time, about a well producing oil by solution gas-drive may be had by assuming that the effective permeability k to oil varies with pressure in the following manner:

$$k = \frac{K}{3}\left(1 + \frac{2P}{P_R}\right) \qquad (2)$$

Substitution of the right side of this equation in Darcy's law for radial flow gives the following proportionality

$$\int \left(1 + \frac{2P}{P_R}\right) dP \propto \log \frac{x}{r}$$

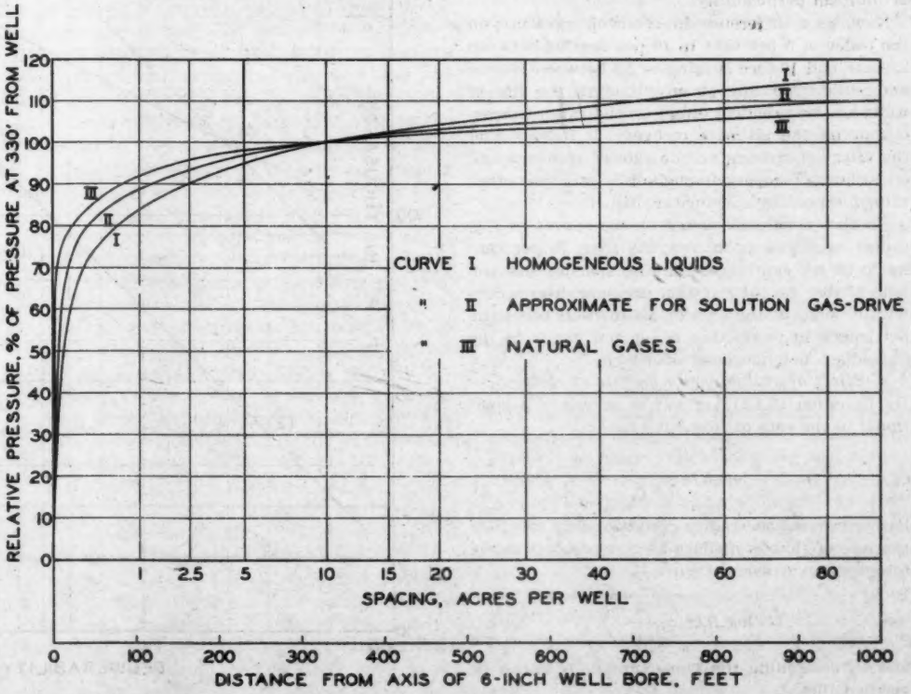


Fig. 6—Pressure distribution for steady radial flow in media of uniform permeability

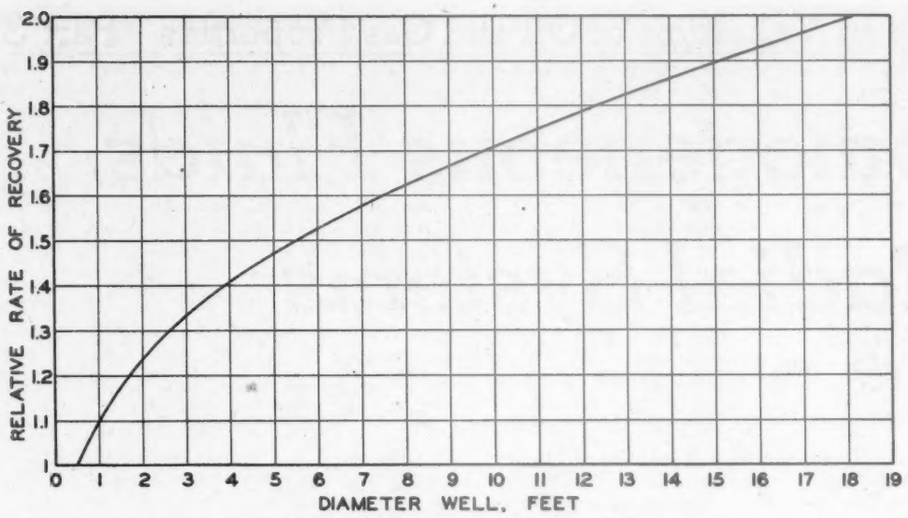


Fig. 7—Effect of well diameter on the rate of recovery

from which

$$P_x + P^2_x = \frac{\log 4x}{1.56} \qquad (3)$$

in terms of a 6-in. well-bore diameter and $P_x = 1$. for $x = 330$, that is, pressure equals 100 per cent at midpoint between wells having 10-acre spacing.

Curve 2 in Fig. 6 is a solution of equation (3.2.3). This curve indicates that the pressure drop at a given time within 50 ft. of a 6-in. well bore for radial flow of gas-oil mixtures through media of uniform permeability is approximately 81 per cent of the total pressure drop over 330 ft. By doubling the distance of flow, which corresponds to a change from 10-acre to 40-acre spacing, the increase in pressure required to maintain a given rate of flow is on the order of 5.5 per cent. Other things being equal, the reservoir pressure at the midpoint between wells having 40-acre spacing must be 5.5 per cent higher than the pressure at the midpoint between wells having 10-acre spacing in order that the rates of recovery be equal. Curve 2 gives the approximate pressure distribution for solution-gas drive in media of uniform permeability.

Now, as a difference in reservoir pressure on the order of 5 per cent to 10 per cent as between 2.5-acre and 10-acre spacing or as between 10-acre and 40-acre spacing at any time in the life of wells has no practical effect on the rate of recovery or on the ultimate recovery, it follows that the effect of spacing on the rate of recovery and on ultimate recovery is negligible, provided other things, especially spacing, are equal.

Another conclusion based on the curves in Fig. 6 may be stated as follows: As from 70 per cent up to 85 per cent, depending on spacing and volume of free gas, of the total pressure drop occurs within 50 ft. of the axis of a 6-in. well bore; the bottleneck in production of oil and gas is in the immediate neighborhood of a well.

3. *Effect of well diameter on rate of recovery.*—By Equation (3.1.2) $\log R/r$ is inversely proportional to the rate of flow, that is

$$\log R/r \propto \frac{1}{Q}$$

letting x equal the radius corresponding to which the rate of flow is n times as great as Q is in the foregoing expression, then

$$\log R/x \propto \frac{1}{nQ}$$

and by combining the two expressions it can be verified that

$$n \log R/x = \log R/r \qquad (1)$$

In terms of 10-acre spacing ($x = 330$ ft.), 6-in. well bore ($r = \frac{1}{4}$ ft.) and other things being equal, the diameter of a well would have to be increased from 6 in. up to 18.2 ft. in order to double the rate of production. The curve in Fig. 7 shows the effect of well diameter on the rate of recovery relative to rate of recovery equals unity for wells having 6-in. well bores and 10-acre spacing.

4. *Radial flow of natural gases.*—The equation for viscous-isothermal radial flow of natural gases through media of uniform permeability may be obtained from the following form of Darcy's law:

$$\int P dP = \frac{14.7\,\mu TZQ}{1.127 \times 5.614 \times 520 \times (2\pi h)K} \int \frac{dX}{x}$$

from which

$$P^2_R - P^2_B = \frac{2.3 \times 14.7\,\mu TZQ \log R/r}{1.127 \times 5.614 \times 520 \times 3.14\,hK}$$

$$= \frac{.00322\,\mu TZQ \log R/r}{hK} \qquad (1)$$

or

$$Q = \frac{306\,hK(P^2_R - P^2_B)}{\mu TZ \log R/r} \text{ cu. ft./day} \qquad (2)$$

which is Darcy's law for viscous flow and isothermal expansion of gases in radial systems of uniform permeability.

Where:

Q = cubic feet per day measured at standard conditions
h = pay thickness, feet
K = specific permeability, darcys
μ = viscosity, centipoises
T = absolute temperature = 460 + °F.
P_R = reservoir pressure, p.s.i. abs.
P_B = bottom-hole operating pressure, p.s.i. abs.
Z = compressibility factor
R = distance to ultimate source of gas, feet
r = effective radius of well bore, feet
log is to base ten

Example 1.—Plot the deliverability for radial flow into a gas well under the following conditions:

P_R = 800 p.s.i. abs.; P_B = 100 p.s.i. *abs.*; μ = 0.015 centipoise; T = 560°; R = 1,000 ft.; r = 1 ft.; Z = 0.9; h = 10 ft.; K = 500 md. when P_B = 100; $P^2_R - P^2_B$ = 640,000 — 10,000 = 630,000 and Q in M.c.f./day is given by

$$Q = \frac{306 \times 10 \times 0.5 \times 630}{0.015 \times 560 \times 0.9 \times 3} = 42{,}500 \text{ M.c.f./day}$$

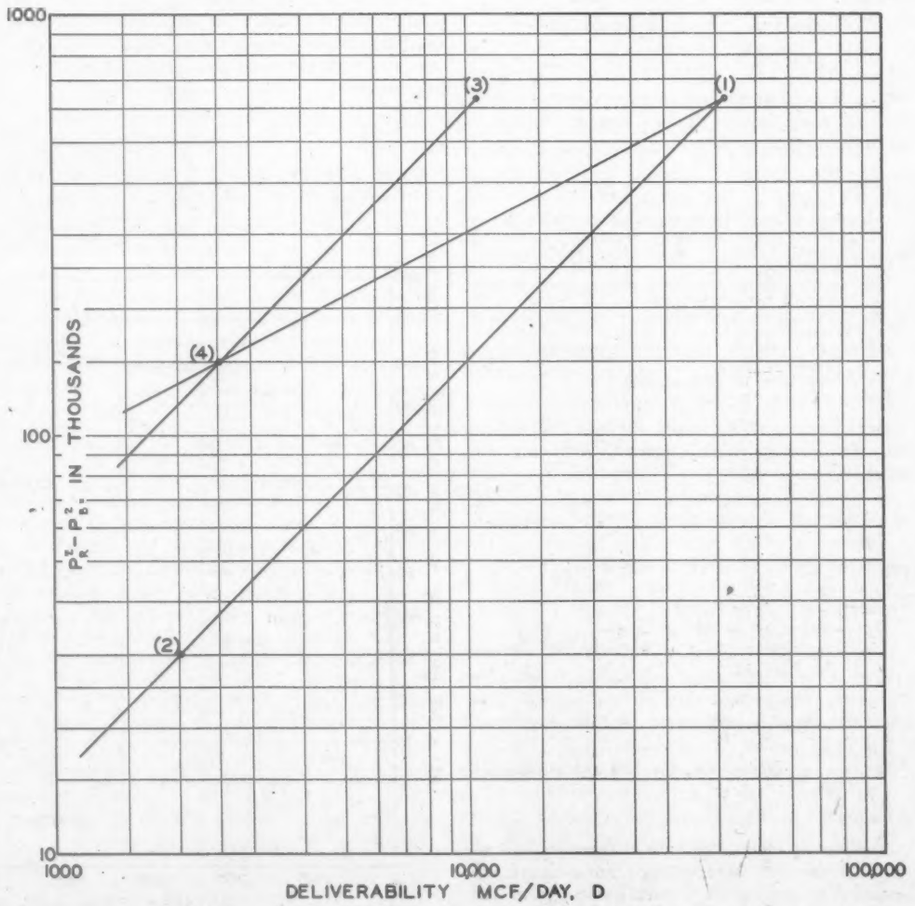


Fig. 8—Deliverability of a gas well

when $P_R = 200$ $\quad P^2_R - P^2_B = 30{,}000$

and

$$Q = 42{,}500 \frac{30}{630} = 2{,}020 \text{ M.c.f./day}$$

The line in Fig. 8 connecting points (1) and (2) is a plot of the deliverability of the gas well in the foregoing example. This line is the solution of the following equation in which the exponent n is equal to unity.

$$D = \frac{Q}{(P^2_R - P^2_B)^n}$$

Example 2.—Plot the deliverability of the gas well in Example 1 if the permeability within 10 ft. of the well bore is decreased from 500 md. down to 50 md.

Letting x equal distance from the well bore and also $K_1 = 0.05$ in the interval $1 \leqq \times < 10$ and $K_2 = 0.5$ in the interval $10 \leqq \times \leqq 1000$, then

$$Q = \frac{306\,hK_1\,(P^2_{10} - P^2_1)}{\mu \log \frac{x_{10}}{x_1}} = \frac{306\,hK_2\,(P^2_{1000} - P^2_{10})}{\mu \log \frac{x_{1000}}{x_{10}}}$$

from which it can be verified by eliminating P^2_{10} that

$$Q = \frac{306\,hK_1\,P^2_{1000} - P^2_1}{\mu\,(\log \frac{x_{10}}{x_1} + \frac{K_1}{K_2} \log \frac{x_{1000}}{x_{10}})} = \frac{306\,hK_1(P^2_R - P^2_B)}{1.2\,\mu TZ}$$

when

$$P_R = 800 \quad P^2_R - P^2_B = 630{,}000$$

and

$$Q = \frac{306 \times 10 \times 0.05 \times 630}{0.015 \times 560 \times 0.9 \times 1.2} 10{,}600 \text{ M.c.f.}$$

when

$$P_R = 400 \quad P^2_R - P^2_B = 150{,}000$$

and

$$Q = 10{,}600 \frac{150}{630} = 2{,}530 \text{ M.c.f./day}$$

The line in Fig. 8 connecting points (3) and (4) is a plot of

$$D = \frac{Q}{(P^2_R - P^2_B)^n}$$

for the conditions of Example 2. It should be noted that $n = 1$ even though the permeability within 10 ft. of the well was reduced from 500 md. down to 50 md. However, the value of n for the line connecting points (1) and (4) is not equal to unity. Therefore, if the permeability in the neighborhood of a gas well decreases upon reduction of pressure during a back-pressure test, the plotted deliverability based on observed data is likely to yield erroneous results.

5. *Relative pressure distribution in a gas pay.*—The relative distribution of pressure around a well producing gas by radial flow from a medium of uniform permeability in terms of a 6-in. well bore and 10-acre spacing is given by

$$P_x = \sqrt{\frac{\log 4x}{3.12}}$$

Curve 3 in Fig. 6 is the solution of this equation. Eighty per cent of the total pressure drop occurs within 25 ft. of the axis of a gas well. If the spacing is increased from 10 acres per well up to 40 acres per well, the increase in pressure required to maintain a given rate of gas flow is only 4 per cent. From Curve 3 it is concluded, for other things being equal, (1) that spacing has a negligible effect on rate of gas recovery and ultimate recovery and (2) that the immediate neighborhood of a well bore is a greater bottleneck for gas wells than it is for oil wells. Actually, pressure gradients in reservoirs are even steeper than those in Fig. 6 because some oil and gas originate along the path of flow. Other things being equal, it follows from the curves in Fig. 6 that the effect of spacing on rates of recovery and ultimate recovery is negligible within practical limits of spacing. Because of paraffin, accumulation of b.s. relative increase in water saturation due to capillary pressure, and relatively lesser oil saturation, it is quite probable that actually 95 per cent of the pressure drop occurs within 100 ft. of a well bore. In view of which it is probable that ultimate recovery could not be increased by closer spacing unless the distance between wells were reduced to considerably less than 200 ft.

References

1. MacRoberts, D. T., "Relation of Gas-Well Spacing to Ultimate Recovery," A.I.M.E., 1936.
2. Muskat, M., "Flow of Homogeneous Fluids," McGraw-Hill Book Co.
3. Rawlins, E. L., and Schellhardt, M. A., "Back-Pressure Data on Natural-Gas Wells and Their Application to Production Practices," U.S.B.M. Monograph No. 7.

●

Drill-Pipe Inspection as Basis for Improving Drilling Technique

(Continued from Page 34)

spraying is often carried on without inspection if the pipe is to be racked, and in this case the dual operation can be accomplished at the rate of 2,000 ft. to 3,000 ft. per day.

East Joint Used to Limit

Before internal tubular study was developed, the operator with a used string of drill pipe generally had but two alternatives when he started a new well. He could play safe by getting a new string or he could risk failure of a weakened joint of the old pipe. Fear of a hidden weak spot cost thousands of dollars each year in junked pipe, since there was no basis for separating good pipe from bad. As pointed out above, interior examination of drill pipe has done much to aid in the development of sounder drilling technique, but its chief service has been, and still is, the detection and elimination of weak joints so that the good joints of the string can be used to their ultimate limit. Under the necessity of getting all possible use out of each drill-pipe joint this service has taken on new importance.

A West Texas contractor recently had in prospect the drilling of just one well. On his racks were three 5,000-ft. strings of pipe, all apparently in the late stages of wear. Buying a new string for one well would mean certain loss of profits; but failure of one of the old joints might mean loss of a far greater sum. Solution of the problem lay in the use of internal examination of all strings. With a drill stem made up of the best joints taken from all three strings the well was completed without mishap. From the remaining joints a second string was made up, thereby making it necessary to junk only the equivalent of one string.

A wide variation is found in the wear and fatigue condition of the average string of used drill pipe. Few drilling firms make a practice of inverting the string, so after several wells have been completed the lowest portion of the string may have drilled 50,000 ft., while the uppermost portion has drilled only a negligible amount of hole. Internal inspection often prevents the discarding of joints that look old merely because they have grown rusty on the drilling-rig pipe racks.

Inspection cannot eliminate all drill-pipe trouble, but it can obviate about 75 per cent of the common fishing jobs if it is employed frequently enough. Frequency of inspection should be established upon the basis of local drilling conditions, and this is a factor that varies widely.

On the Gulf Coast, where the average drill-pipe life is from 150,000 to 200,000, the string should be inspected each time it completes 60,000 to 75,000 ft. of hole. In this way a substantial part of some strings have been made to last for upwards of 300,000 ft. of hole.

Severe Conditions at Abell

Perhaps the field most destructive to drill pipe ever to be developed is the Abell field of West Texas. Normal drill-pipe life in the Permian basin is somewhere between 80,000 and 125,000 ft., but in the Abell pool a string lasts for only 25,000 to 40,000 ft. Conditions, however, are such that internal inspection can readily detect the fatigue cracks that most commonly lead to fishing jobs in the field. It is therefore considered good practice to inspect the drill string as soon as it has drilled its first three wells, then again after the suceeding two wells. After these two inspection jobs have been acted upon, most of the original string will have been replaced.

Tool joints are not ordinarily calipered in the Abell field when a string of pipe is inspected, because the life of the pipe is too short for outside abrasion to become an important consideration. In that part of the Permian basin lying north of the Abell field, the use of an outside diameter pipe gage is an essential part of the drill-pipe inspection, and recommendations include a consideration of tool-joint replacement or refacing.

When tool joints must be replaced or refaced because of external wear, then internal inspection becomes a useful preliminary operation, as it saves expenditure of money on joints that do not warrant the work.

In appraising the strength of pipe by internal visual analysis, much emphasis is placed on the fact that any pit may serve as a stress concentration point from which a crack or break can begin. If a corrosive condition is likely to be present in the mud, danger of a break is considered more imminent, for it has long been recognized that corrosion works hand-in-hand with the physical forces that flex the drill pipe to cause early failure.

As a drill string is inspected, the joints are permanently marked. Four center-punch marks on the end of the pin, or in the counterbore of the box, means that the joint should not be used again in drilling service. Three marks indicate that the pipe is still usable but is showing definite effects of wear. Two marks mean that the pipe may be continued in service without restrictions and warrants the replacement of tool joints if they are needed. One mark indicates that the joint is as good as new for all practical purposes.

Conclusions

1. Drill-pipe inspection has been used successfully as a guide in developing pipe-saving drilling technique. In one case it doubled the average life of pipe merely by indicating the relief of stresses that could be brought about by keeping the entire string in tension while making hole.

2. By making it possible to weed out the defective joints of a worn string, internal inspection gives the operator the opportunity of obtaining maximum service from all sound joints of drill pipe.

3. When drill-pipe inspection is employed prior to the replacing of tool joints, it saves money that would otherwise be spent on reconditioning faulty pipe lengths.

Pressure-Temperature Relations Of Petroleum Fractions

By W. L. NELSON and WILLIAM HALTENBERGER, JR.
School of Petroleum Engineering, University of Tulsa*

SUMMARY

Distillation curves of mixed-base petroleum oils at several subatmospheric pressures have been correlated against one another and against those of pure, normal paraffin hydrocarbons. The effect of vacuum is to displace the distillation curve vertically by a constant number of degrees at all points. The distillation data can be represented by converging lines on a Cox chart with the points of convergency lying along a line of constant pressure. Lines of constant percentage-distilled deviate slightly from the behavior of the paraffin hydrocarbons, and the extent of the deviation is greatest at relatively low and at high percentages taken overhead. Change of pressure alters the boiling points of petroleum fractions to a lesser extent than it alters the boiling points of the paraffin hydrocarbons. Here is printed half of the discussion. The balance will appear next week.

THE study of the pressure-temperature relations of commercial fractions is greatly complicated by the fact that the composition of the liquid and vapor phases must, as a rule, remain undefined. Methods of chemical or compound analysis must be supplanted by distillation curves which show only the average boiling points of successive mixtures whose composition cannot be completely known.

The fundamental difference among the various types of laboratory distillation lies in the boiling range of the liquid droplets that accumulate on the thermometer bulb, and the equilibrium that is attained between these drops and the surrounding vapor; in other words, in the extent of fractionation a given fraction of the sample has undergone. The extremes are true-boiling-point distillation wherein equilibrium is established between the liquid phase and the vapor phase of a single component, and flash vaporization, wherein equilibrium is established among all of the components originally present in the sample. In intermediary types of distillation, such as the A.S.T.M., Engler, and Hempel, successive instantaneous equilibria of more or less narrow-boiling fractions are measured. Yet in all mechanisms of batch distillation, the recorded vapor temperature will always be an equilibrium temperature, or near-equilibrium temperature, between a vapor having a definite history and a liquid condensing therefrom.

Except for the difference in time allowed for the establishment of equilibrium, it appears that any method of distillation is equally suitable for the measurement of pressure-temperature relations, and the same general relations should hold for all of them. In no situation, however, except possibly in equilibrium flash vaporization, is it possible to produce a vapor that has what we commonly describe as a wide boiling-range mixture.

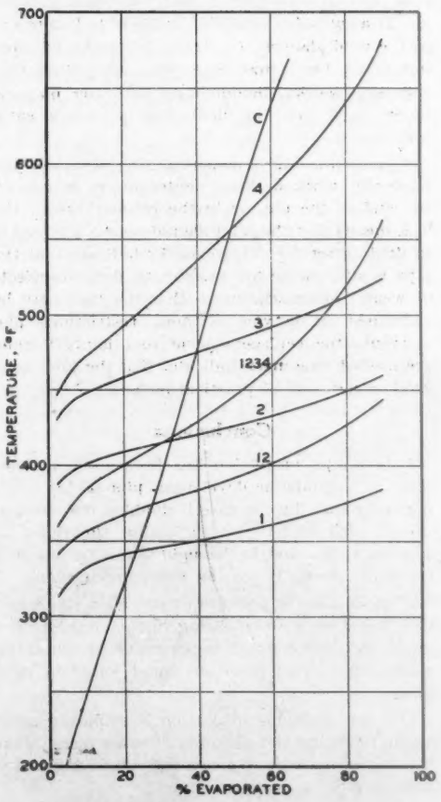
The purpose of this investigation is to furnish additional data on the pressure-temperature relations of moderately wide-boiling petroleum fractions, and to relate their behavior to that of narrow-boiling mixtures and the pure hydrocarbons. The experimental method used consists of a series of A.S.T.M.-type distillations of the same material at different pressures.

The most extensive published data on the vapor-pressure of petroleum products deal with the effect of pressure on the bubble point. Bridgeman, Aldrich, and White[4] investigated the bubble points of 33 different gasolines of widely differing characteristics, at pressures from about 10 mm. Hg to atmospheric. Meyer[3] correlated the bubble-point determinations of five investigators on 14 gasolines with the data of Bridgeman, Aldrich, and White, and extended the range of correlation to 10,000 mm. Beale and Docksey[5] investigated the mean boiling points of six narrow cuts of Persian crude, ranging from gas oils to heavy lubricating oils, at pressures ranging from 0.1 mm. Hg to atmospheric. These investigators measured the equilibrium temperatures established during a continuous refluxing of the distillate. Working alone, Beale[2] extended the pressure range of the correlation obtained by Beale and Docksey to the critical pressure, and proposed a correlation for wide-boiling fractions, based on the mean boiling points of seven wide-boiling residues of a mixed-base crude oil. The apparatus used by these two investigators was such that it permitted appreciable vapor formation, and did not exclude the possibility of a change of liquid composition with a change in pressure. The results of these investigators, especially in the case of wide-boiling fractions, may not be comparable to results obtained by using a different type of apparatus.

The above investigators dealt with the effect of pressure on the temperature at one constant composition. The effect of pressure on the entire distillation curve of petroleum fractions was studied by Watson and Wirth,[10] who present a correlation on the Engler distillation of high-boiling wide-range fractions at about 0.2 mm. Hg and at atmospheric pressure. Piroomov and Beiswenger[9] give data on the flash vaporization of a cut from a Colombian crude oil at 10 mm. Hg and at atmospheric pressure. Bahlke and Kay[1] correlated constant percentages evaporated for a gasoline and a naphtha in the range from 60 mm. Hg to the critical pressure.

The experimental data presented in this paper were obtained by A.S.T.M.-type distillations of 10 commercial distillates taken from an Oklahoma crude oil. Distillation pressures ranged from 25 to 760 mm. Hg. The main experimental data were

*The development of this subject was first undertaken by Mr. Haltenberger as a special assignment and his death early in 1941 caused Professor Nelson to allocate some of the subsequent experimental work among several advanced researchers at the university.



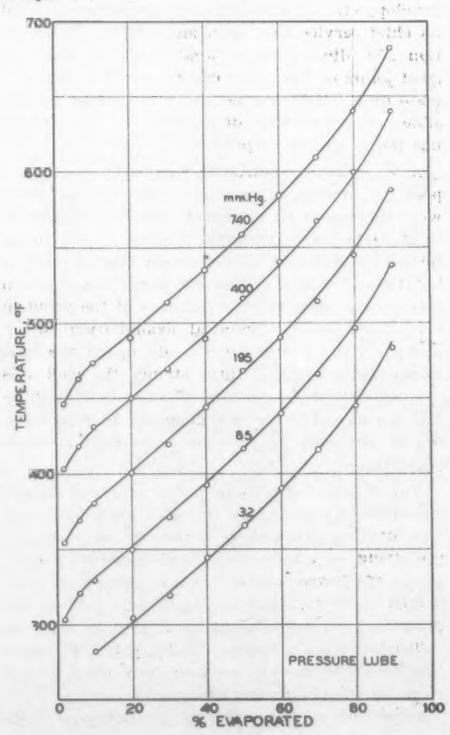


Fig. 1 (left)—Atmospheric distillation curves of the samples used in the Engler distillation and of the parent crude. Fig. 2 (below)—Engler distillation curves of Sample 4

obtained on six materials which were distilled by an Engler-type of distillation (500 cc. samples), but in making correlations recourse was also had to studies of four materials which had been examined many years ago and during routine classwork (100 cc. samples and using the regular A.S.T.M. procedure) at the university. In this paper the six distillations upon which the correlations were primarily based will be referred to as Engler distillations. In spite of the lesser degree of accuracy of the A.S.T.M. distillations, they were found to fit into the general correlation with reasonable accuracy.

Procedure and Data

Only the procedure for the Engler distillations will be discussed because the familiar A.S.T.M. procedure was employed in the A.S.T.M. distillations.

Five hundred cubic centimeter samples were distilled in a 1,000-cc. vacuum distilling apparatus (No. C-420) of the Scientific Glass Apparatus Co. The flask was not shielded and heat was applied by a gas burner so regulated as to keep the rate of distillation at about 8 cc. per minute, except in runs which were purposely conducted at other rates. Enough cooling was provided to bring the condensate to within a few degrees of the cooling-water temperature regardless of the vapor temperature. When necessary, iced water was used in the condenser.

Temperatures of the vapor were read by a calibrated mercury thermometer at every 10 cc. collected, except at the beginning of the distillation, where temperatures were read at 5, 10, and 15 cc. collected. Temperatures and gravities of each 100-cc. fraction were determined as soon as collected. Distillation was stopped at 90 per cent distilled.

The observed temperatures were corrected for the temperature of the emergent stem of the thermometer (negligible in most instances), and for minor variations of pressure, the latter by means of a pressure versus temperature plot based on the uncorrected values, but covering a sufficiently wide range to give small corrections of the desired accuracy. To construct isobars of temperature versus per cent evaporated, the volumes collected were converted to per cent distilled by correcting them to the temperature of the original sample. Percentages evaporated were calculated by adding the distillation loss to the percentage distilled. The per cent loss was very small in the Engler distillations but was an important item in the A.S.T.M. distillations.

To minimize the effect of mechanical errors in reading volumes and temperatures, and of temperature fluctuations due to extraneous causes, temperature readings both above and below certain percentages were averaged, and the average was taken as the true temperature at that percentage. Three temperature readings were averaged around the 2, 6, and 10 per cent points, and five around subsequent multiples of 10 per cent evaporated. The 90 per cent point was corrected, where indicated, by extrapolating through the 86 and 88 per cent points. No attempt was made to correlate the initial boiling points.

TABLE 2—DEVIATIONS OF INDIVIDUAL RUNS FROM AVERAGE, ENGLER DISTILLATIONS

Run No.	Pressure mm. Hg	Rate, cc./min.	Room temp. °F.	Deviations, °F. Ind. ave. at 50%	Deviations, °F. Arithm. aver.
Sample 1					
1	740	8.0	87	—0.5	0.5
2	740	12.1	80	+0.5	0.5
3	500	7.9	81	—0.4	0.6
4	500	7.3	85	+0.4	0.6
5	300	10.0	83	—0.7	0.5
6	300	8.5	86	+0.7	0.5
Sample 12					
29	740	11.1	80	—0.6	1.0
30	740	6.5	74	+0.6	1.0
Sample 2					
8	740	4.6	60	—1.3	1.1
9	740	6.2	75	+1.3	2.0
10	740	8.0	88	—1.0	1.4
11	740	8.7	85	+1.2	1.3
12	740	9.7	54	—0.2	0.7
Sample 1234					
34	740	8.9	86	+0.8	1.3
35	740	5.0	80	—0.8	1.3
37	195	8.8	83	—1.0	2.6
38	195	8.0	84	+1.0	2.6
Sample 3					
16	740	17.0	88	+0.4	0.8
17	740	6.8	63	—0.4	0.8
21	32	9.5	83	0.0	0.6
22	32	10.0	83	0.0	0.6
Sample 4					
23	740	10.7	90	—2.6	1.6
24	740	9.0	85	+2.3	2.2
25	740	8.5	59	+0.3	2.5

Experimental Results

Including repeat runs, 39 distillation curves were obtained on six samples by Engler distillation, and 29 curves on four samples by A.S.T.M. distillation. The properties of these samples are summarized in Table 4, along with data of other investigators. Sample 12 is a blend of 50 per cent by volume of Samples 1 and 2. Sample 1234 is a blend of 25 per cent each by volume of Samples 1, 2, 3 and 4. Atmospheric distillation curves of the six samples used in the Engler distillation, and of the parent crude, are shown in Fig. 1.

In the Engler distillation, at least two runs were made at atmospheric pressure, and such runs at lower pressures as seemed of doubtful accuracy, were also repeated. Original data for the runs that were not repeated, and averages of the repeated runs, are given in Table 1. Deviations of the individual runs from the average are given in Table 2. A plot of the values of Table 1 is shown for Sample 4 (Fig. 2). Values for the other Engler distillation samples are not shown graphically, as they exhibit the same as, or better agreement than Sample 4.

Gravities were taken of each 100 cc. (20 per cent) fraction, the last 50 cc. fraction, and the residue, permitting the construction of gravity mid per cent curves. The A.P.I. gravities at 60° F., as functions of per cent evaporated, are given in Table 1. It was found that the gravities of a given fraction were not affected appreciably by the pressure at which the distillation was conducted. The values of the individual runs on any one sample were as a rule within 0.1° A.P.I. of the average, and never differed by more than 0.3° A.P.I.

The reproducibility of the results obtained by the Engler distillation conforms to A.S.T.M. standards, that is, temperatures on the repeat runs check each other within 4° F. throughout the main body of the distillation curve. The conditions under which repeat runs were taken, and deviations of the individual runs from the average, are shown in Table 2. The deviations are shown as shifts in the temperature of the 50 per cent points, and as arithmetic average deviations over the entire distillation range.

It appears from Table 2 that the deviations do not bear a direct relation to either the rate of distillation or to room temperature. Runs 10 and 11, for instance, at about the same rate of distillation and same room temperature, differ from each other more than either Runs 8 and 12, or 11 and 12, which represent extreme rates and room temperatures respectively. On the other hand, Runs 16 and 17, at extreme rates and room temperatures, are in good agreement with each other. It is probable that the deviations, such as they are, are due primarily to inaccuracies in determining distillation losses. Difficulties experienced in getting good material balances indicated that errors of about 1 per cent in volume determinations may have occurred. Such errors would cause shifts in the distillation temperatures which would account approximately for the deviations that were found.

Experimental data on the A.S.T.M. distillations are given graphically in Figs. 3, 4, 5 and 6. The

TABLE 1—EXPERIMENTAL DATA, ENGLER DISTILLATIONS

Sample 1

Per cent evap.	A.P.I. gravity	Temperatures, °F., at pressures, mm. Hg. 740	500	300	150
2	...	313	287	251	214
6	51.3	325	303	266	230
10	50.8	333	307	275	237
20	49.2	341	316	382	246
30	48.4	346	321	289	250
40	48.0	350	325	293	256
50	47.8	356	331	297	260
60	47.5	361	336	304	266
70	47.2	367	342	310	273
80	46.8	376	350	318	280
90	46.0	384	360	328	290

Sample 2

A.P.I. gravity	Temperatures, °F., at pressures, mm. Hg. 740	400	195	85
...	387	345	301	255
45.0	396	354	310	262
44.0	401	359	314	269
43.8	409	365	320	276
43.4	414	372	327	283
43.1	421	377	332	289
43.0	427	382	339	292
42.8	433	389	345	300
42.4	440	397	353	308
41.8	449	405	361	317
41.2	461	418	372	329

Sample 12

Per cent evap.	A.P.I. gravity	Temperatures, °F., at pressures, mm. Hg. 740	400	195	85
2	...	336	296	254	213
6	49.5	351	312	269	228
10	48.9	357	319	274	236
20	47.6	368	328	284	244
30	46.7	376	336	293	249
40	46.2	383	344	300	256
50	45.7	393	353	309	265
60	45.3	401	360	318	274
70	44.6	413	370	329	284
80	43.1	426	385	341	296
90	40.9	444	403	360	313

Sample 3

A.P.I. gravity	Temperatures, °F., at pressures, mm. Hg. 740	400	195	85	32
...	430	383	337	291	245
42.0	443	394	348	303	257
41.6	448	401	357	309	263
40.9	458	415	369	321	274
40.4	467	422	377	330	282
40.0	476	430	385	338	290
39.7	484	439	393	347	299
39.4	492	448	402	355	308
39.0	501	457	410	363	316
38.7	511	467	420	373	325
38.2	523	479	434	386	338

Sample 1234

Per cent evap.	A.P.I. gravity	Temperatures, °F., at pressures, mm. Hg. 740	400	195	85
2	...	359	315	274	229
6	47.3	374	331	290	246
10	46.8	384	342	299	255
20	45.8	400	357	311	269
30	44.6	414	371	326	283
40	43.5	428	388	343	296
50	42.4	446	406	360	313
60	41.2	466	424	380	331
70	40.0	489	447	401	352
80	37.8	517	475	431	382
90	35.1	563	521	477	426

Sample 4

A.P.I. gravity	Temperatures, °F., at pressures, mm. Hg. 740	400	195	85	32
...	446	403	354	303	...
41.4	463	418	367	321	...
40.7	473	431	381	330	282
39.4	490	450	400	349	305
38.4	514	470	419	371	319
37.4	536	489	444	393	344
36.4	558	516	468	416	365
35.5	583	541	490	440	390
34.5	609	567	514	466	416
33.2	640	599	545	497	445
30.3	682	639	588	538	484

curves on these plots represent values correlated by methods that will be discussed later. The A.S.T.M. distillation data are somewhat less consistent than the data on the Engler distillations. This is to a great extent due to the fact that the effect of errors in volume determinations for a 100-cc. sample is five times that for a 500-cc. sample. Realizing that, by the method of their determination, distillation losses mask any other kind of loss in the system, the A.S.T.M. data appear to be sufficiently consistent. Exceptions are the data below 20 per cent evaporated for the wax distillate (Fig. 6). It is obvious that a nonfractionating type of distillation is not suited to the determination of equilibrium temperatures if rapid changes in the composition of the liquid are involved. The A.S.T.M. runs were conducted many years ago in routine classwork, and hence they could not be repeated or checked at this time.

Methods of Correlation

The Young and Ramsay-Young relations, with various modifications, have been widely used in correlating vapor pressures. These relations can both be derived from the Clausius-Clapeyron equation.

The original form of the Young relation, log $p = A + B/T$, where T is the absolute boiling point at pressure p, and A and B are constants, when applied to pure hydrocarbons yields straight lines over pressure ranges of at least two logarithmic cycles on plots of log p versus $1/T$. A modification by Cox[7] involves the selection of an arbitrary temperature scale in place of $1/T$, which makes the vapor-pressure curve of a given reference substance into a straight line. The temperature scale of a Cox chart based on water is shown by Calingaert and Davis[8] to be proportional to $1/(388+t)$, where t is degrees F.

The vapor pressures of related substances when plotted on a Young or Cox chart tend to converge to a common point. Distinct points of congruence are indicated for the paraffin, olefin, and naphthenic hydrocarbons; and the same is true of the data of Bahlke and Kay[1] for gasoline and naphtha. Upon careful examination, however, it appears that the vapor-pressure lines of the higher members of a series exhibit some curvature on a Cox chart and they do not converge to the common point of the lower-boiling members of the series. As a makeshift, convergency can be obtained by drawing tangent lines to each of the vapor-pressure curves at points of lower and lower pressure as the series is ascended toward the high-boiling members. This is indicated in Fig. 7 which is an extended Cox chart showing the 2, 50, and 90 per cent distilled lines for the pressure lube sample (Fig. 2), and also a fourth line which is included only as an extreme case for indicating the deviation at even higher temperature ranges. By drawing the tangents as suggested above, the vapor-pressure lines can be accurately represented by straight congruent lines through pressure ranges of one or two logarithmic cycles. If, however, the lines of tangency are drawn through a single value of pressure, the data cannot be accurately portrayed throughout a pressure range exceeding about one cycle and a temperature range greater than about 200° F. The data used in plotting Fig. 7, and all of the experimental data recorded in this paper, indicate clearly that distillation curves of oils at different pressures exhibit parallelism. In other words, tangents drawn to distillation curves at different pressures, are parallel to one another. The data of Watson and Wirth[10] in at least the range of 20 to 75 per cent evaporated, and the flash vaporization data of Piromoov and Beiswenger, also exhibit parallelism.

(To Be Continued Next Week)

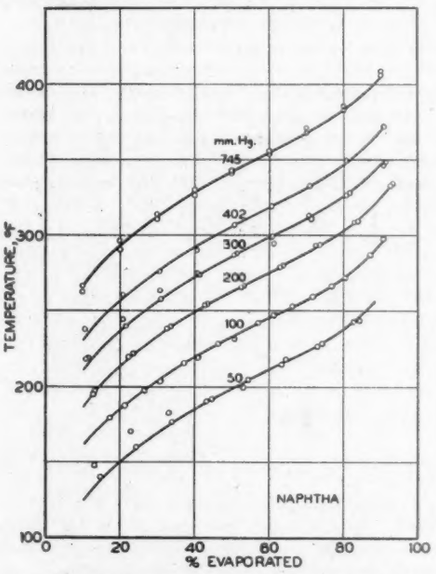


Fig. 3—A.S.T.M. distillation curves of Sample A-1

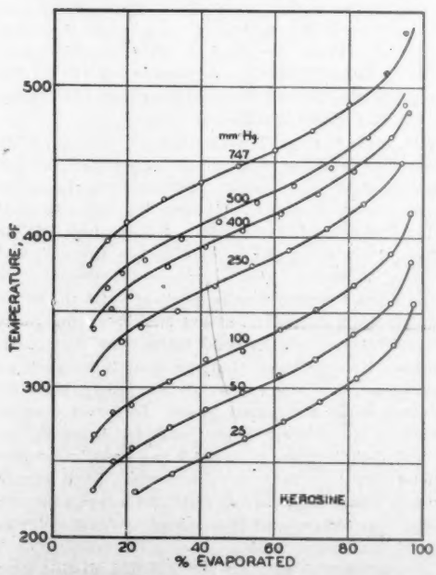


Fig. 4—A.S.T.M. distillation curves of Sample A-2

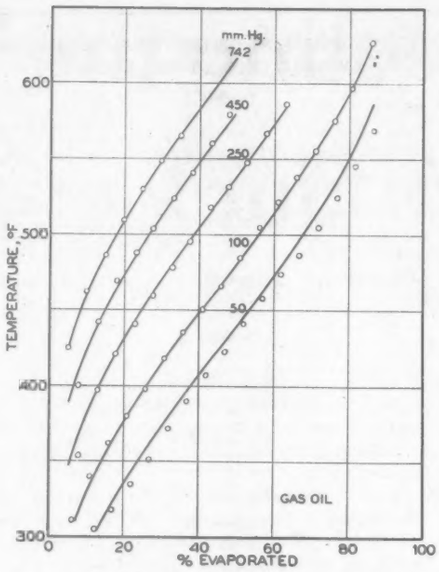


Fig. 5—A.S.T.M. distillation curves of Sample A-3

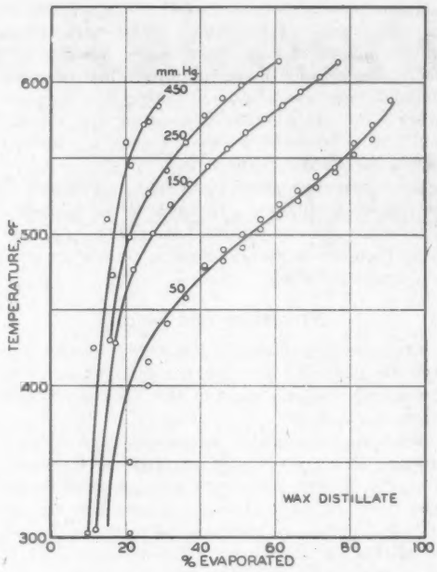


Fig. 6—A.S.T.M. distillation curves of Sample A-4

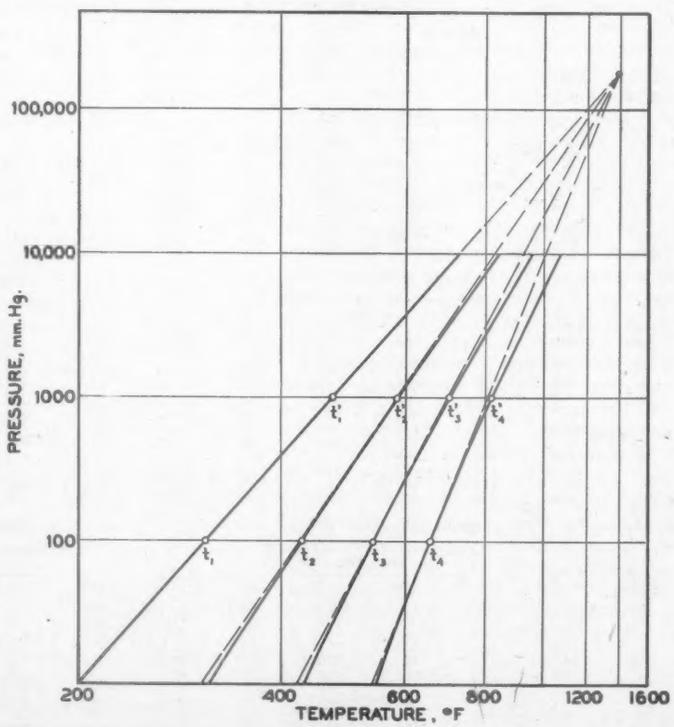


Fig. 7—Congruent constant composition lines on Cox chart. Solid lines represent parallel isobars on a temperature-composition chart

Factors Affecting the Volumetric Efficiency of Sucker-Rod Pumps

By G. M. STEARNS
Associate Professor of Petroleum Engineering, University of Oklahoma

This is the first of two articles by the author dealing with pump performance which will appear in The Oil and Gas Journal. The initial installment discusses the inherent well conditions and the design of pumps which affect their efficiency. The second installment outlines the program and the equipment setup of the A.P.I. for testing pump operation at the University of Oklahoma.

THE oldest and still the most generally used method of lifting oil from wells is the rod-actuated plunger pump. Many improvements and refinements have been added to the original design of this type of pump to make a device better suited to the purpose it is to serve. There are numerous variations in design of this type of pump, many of which are justified because of the fact that pumping conditions vary from one pool to another, from one well to another within a pool, or even in a particular well from one period to a later period in its pumping life. In order that the operator may cope with these changing conditions and pump each well in the most efficient manner, it is desirable that he have a large number of styles and variations in design to choose from when selecting a pump.

It should be recognized, however, that some variations in design are possibly unjustified since field use often shows that certain design features or certain trial methods should be discarded because they do not have the desired effect. The American Petroleum Institute has done much to standardize pumping equipment and has received cooperation from equipment manufacturers and producers in eliminating many of the variations in sizes and design that could not be justified by operating conditions.

Various experiments have been conducted and field studies have been made to ascertain the effect of different factors on the volumetric efficiency of the plunger pump. Uren, Collins and Sargent* were among the earliest to make experiments solely for the purpose of measuring the effect of controllable factors on volumetric efficiency. The California district subcommittee of the A.P.I. topical committee on production practice sponsored the most recent and most elaborate of any study completed along this line.†

The volumetric efficiency of a pump, as ordinarily used, may be defined as the ratio of the volume of "stock-tank" crude oil pumped to the volume of pump displacement for the same given period of time. In this discussion, volumetric efficiency will be considered as based upon actual plunger travel rather than polished-rod travel. For this reason, a consideration of sucker-rod stretch will not be included.

Based upon field experience, reported investigations, and plain logic, the factors listed below have been chosen as the conditions that may possibly influence the volumetric efficiency of a sucker-rod pump:

I. Inherent well conditions:

(1) Amount of gas in solution in the fluid being pumped that may be reduced from solution between the valves of the pump. (2) Viscosity of the pumped fluid. (3) Temperature of the fluid being pumped. (4) Foam accumulation in the well bore. (5) Well depth. (6) Suspended solids in the fluid. (7) Density of the pumped fluid.

II. Pump design:

(1) Size and shape of valve openings. (2) Minimum clearance volume between valves. (3) Plunger fit. (4) Type of check (ball, drop, plumb bob, etc.). (5) Size, length, and design of gas anchor. (6) Plunger length. (7) Plunger surface, i.e., (1) metal versus leather or composition, or (2) grooved metal versus plain metal.

III. Pump operation:

(1) Length of stroke. (2) Valve spacing. (3) Pumping speed. (4) Submergence.

Since the inherent well conditions are uncontrollable, i.e., in general, they cannot be changed by anything the operator can do, the only solution is to install pumping equipment of such design and operate it in such a manner that well conditions which tend to lower the pump efficiency will have a minimum effect.

Let us now consider each of the 18 factors listed above in the light of what is now known, or can be theorized, and consider the proved or expected effect of each factor and the steps that may be taken to properly regulate or combat low volumetric efficiency that may be at least partially attributed to any particular condition.

Inherent Well Conditions

The most troublesome condition in many pumping wells is the gas in solution in the oil that is released after the oil enters the bottom of the gas anchor and before the oil passes through the traveling valve of the pump. This factor is interrelated with several of the others mentioned in the list. It is affected by the temperature of the pumped fluid, since at higher temperatures the gas will be more easily released from solution in the oil. Possible release of gas is also affected very materially by the design of the pump.

The size and shape of fluid passages leading to and through the standing valve control the drop in pressure that occurs when the fluid enters the space above the lower valve. It is generally agreed among pump authorities that it is advantageous to use large streamlined fluid passages at the standing valve entrance in order to keep the drop in pressure to a minimum so that the maximum amount of gas will be kept in solution within the pump.

In this connection, it should be pointed out so long as the submergence pressure forcing the oil into the pump is sufficiently high that after the pressure drop through the standing valve has occurred the pumped fluid is still at a pressure above its "bubble point" pressure at the existing temperature, we could expect no release of gas from solution and consequently no reduction in pump efficiency from this source. It is unfortunate, however, that in numerous wells conditions are not so favorable, and the release of solution gas within the pump may considerably reduce the pump efficiency.

The viscosity of the pumped fluid would have a bearing upon the amount of resistance to flow of that fluid into the pump. Considering an extreme condition, a highly viscous fluid, at high pumping speeds with low submergence pressures could result in incomplete filling of the pump each stroke regardless of whether solution gas were present. As a result the volumetric efficiency of the pump would be lower.

In handling fluids of low viscosity, closer plunger fits are required in order to prevent lower efficiency due to slippage by the plunger on the upstroke. Therefore, it should be remembered that when pumping oils of low viscosity a closer plunger fit is required than when pumping oils of higher viscosity. Temperature is again interrelated here, in that oil viscosity decreases as the temperature increases and increases as the temperature decreases.

In addition to temperature effects mentioned in connection with other factors already discussed, there is another possible effect; namely, differential expansion of plunger and liners when they are made of dissimilar metals. This may result in a variation in plunger fit for pumps of a given fit at ordinary temperatures.

Field evidence has demonstrated that in some wells there is a stable oil-gas foam which exists in the well bore and results in a very low pump efficiency, due to the fact that even though the pump fills with the well "fluid," the efficiency may be as low as 20 per cent because the pumped "fluid" is only 20 per cent crude oil at the pump

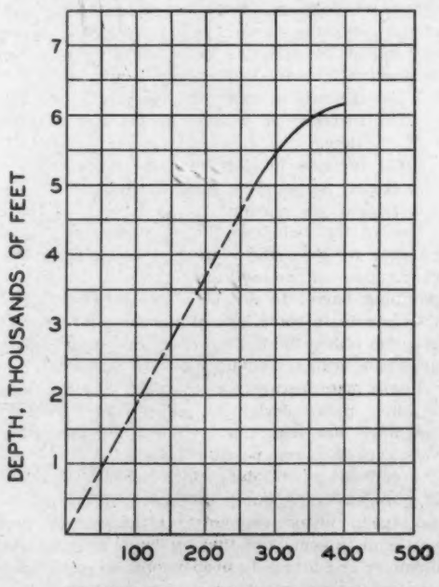


Fig. 1—Pressure gradient in well containing foam

*Uren, L. C., Collins, V. J., and Sargent, S. B., "Influence of Submergence on the Efficiency of the Oil Well Plunger Pump." Petroleum Development and Technology in 1925, A.I.M.E., 1926, pp. 156-69.

†Tallant, E. P., "Report on A.P.I. Pump Performance Experiment," Drilling and Production Practice, 1938, American Petroleum Institute, New York.

level. Fig. 1 is a curve representing the pressure gradient in a well in the Crescent pool of Oklahoma. The curve indicates that foam existed in the well from top to bottom at the time the pressure readings were taken. This well had been inactive for 15 days, which indicates the stability of this foam condition. Similar tests in the Oklahoma City field have shown that foam remained on top of liquid in the hole even after a well was inactive for several days.

H. F. Beardmore* states that tests made on various subsurface foams show that they consist of from 16 to 23 per cent liquid by volume. Several oil-gas foams tested at the surface were found to contain from 23 to 40 per cent liquid by volume.

Various field treatments have been applied in attempting to solve this foam problem with results which were, in general, unsatisfactory.

The principal effect of well depth would be the effect upon slippage of fluid by the plunger. In deep wells with low fluid levels one would expect this effect to be most pronounced. So, in such deep wells, closer plunger fits are required than for similar wells at shallower depths.

Since solid particles in the fluid are usually abrasive, the principal effect of such material is the wear that it causes. This wear results in a loose plunger fit after a relatively short period of use or causes rapid abrasion of the valves which allows leakage through them.

The density of the pumped fluid may have a slight effect, since the submergence pressure on the entrance to the standing valve and the pressure on top of the plunger are determined by density of the fluid in combination with height of the fluid column. The pressure drop through the valve and other passages of the pump would also be influenced somewhat by the density of the fluid.

Pump Design

As stated above, it is desirable, in pumping oil which contains gas in solution, to regulate the pressure loss between the entrance to the lower end of the "mosquito bill" and the space above the standing valve. This pressure loss must be kept small enough that the minimum amount of gas is released from solution within the pump. Such a requirement dictates to the pump designer that the size and shape of the entrance to, and passage through, the standing valve be sufficiently large and streamlined to reduce the pressure loss and turbulence in the oil stream to a practical minimum. It is self-evident that each of the following factors would require a larger opening at the standing valve entrance in order to prevent increase in pressure drop:

1. An increase in pump displacement, by:
   (*a*) Increase in plunger travel per unit of time.
   (*b*) Increase in plunger size.
2. Higher viscosity of pumped fluid.
3. Longer gas anchor.

Use of top holddown insert pumps makes it possible to place the standing valve below the perforations of the mud anchor, which allows the pumping barrel to act as a mosquito bill, and thus eliminate some loss of pressure that would occur in either the bottom holddown insert pump or in the ordinary tubing pump.

Pump manufacturers have taken definite steps in their pump design to reduce the minimum clearance between the standing and traveling valves to the least possible value.

Robinson† reports data which indicate the effect of plunger fit on pump efficiency. Slippage, resulting in lower volumetric efficiency, is proportional to some function of depth and plunger diameter and inversely proportional to some function of plunger length and oil viscosity. Robinson reports that leakage by the plunger was found by field test to increase approximately as the cube of the fit of the plunger. Fig. 2 is a reproduction of a curve published from the results of his tests.

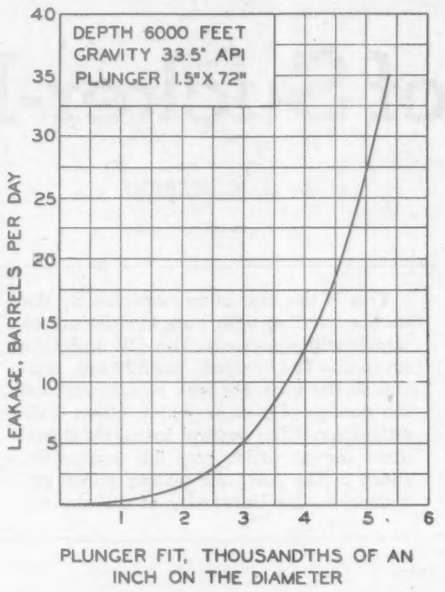


Fig. 2—Leakage past a pump plunger

It is desirable to design the check and its seat so that turbulence through the standing valve is kept at a minimum when pumping oils which may release gas from solution. Of course, manufacturers have other considerations, such as length of trouble-free service and resistance to wear, to consider in design of these checks. Although a valve may be built which is more nearly streamlined than the ordinary ball and seat, such valves have not proved entirely satisfactory.

The ordinary gas anchor is designed to eliminate free gas from entry to the pump. The simplest and most commonly used gas anchor is illustrated in Fig. 3. Oil and gas enter the perforations near the top as indicated by the arrows and if the velocity of flow downward is low enough the free gas will rise in the oil and escape at the top as indicated by arrows. The annular space between the mud anchor and the mosquito bill should be large enough to keep the oil velocity below the rate of rise of the gas bubbles in the oil, which Robinson‡ assumes to be about the same as that reported for rise of bubbles in water, about 6 in. per second.

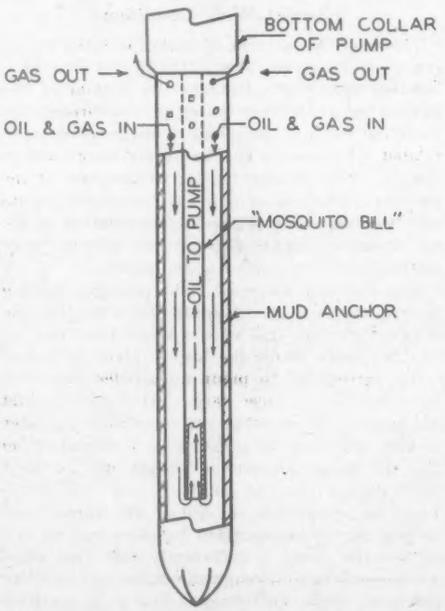


Fig. 3—Simple type of gas anchor

It is certain that there is some diameter and length of gas anchor that best suits any pumping condition. If the mosquito bill is too short it will not serve the purpose for which it is designed—that of removing free gas from the fluid stream. Its diameter must be kept below a certain value because of the need for sufficient annular space for the downward movement of fluid. On the other hand, the gas anchor may be too small in diameter or too long. Either of these extremes would result in too great a loss in pressure when the fluid passed through the anchor, causing incomplete filling of the pump on each stroke. It is believed that this effect would be more pronounced when pumping oils containing considerable gas in solution, especially if temperature conditions and gas solubility characteristics of the particular oil being pumped happen to be favorable for a marked release of gas due to a relatively small drop in pressure.

Pump Operation

It is well recognized that longer strokes in pumping promote longer life of rod strings for a given plunger travel because of fewer reversals of stress in the rod string. It is also clear that in pumping "gasified" oils, the ratio of the clearance space between the valves to the plunger travel has a bearing on the expected volumetric efficiency. From this standpoint, a long stroke with a given clearance between valves should promote a higher efficiency than a shorter stroke with the same clearance. It is believed that the consideration should be from the standpoint of linear velocity of the plunger as well as from the standpoint of stroke length alone. This requires a combination of pumping speed in strokes per unit of time with length of stroke. It is probable that one of the principal limiting factors on the capacities of pumps operating at considerable depths is the pressure loss that occurs across the standing valve. This pressure loss may be largely attributed to high plunger speeds.

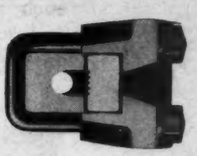
It is now generally agreed that it is desirable to "space a well" so that the valves are as close together as possible in order to take full advantage of the minimum clearance incorporated in the design of the pump by the manufacturer. The advantages of this practice have already been indicated in the discussion of minimum clearance between the valves.

Placing the pump at the bottom of the well in order to secure the maximum submergence pressure on the entrance to the standing valve is a practice that should promote the maximum volumetric efficiency.

It should be noted that much of the preceding discussion represents opinion only, and is in many cases not based upon concrete field evidence or experimental results. It is believed that additional experimental study will reveal new information which may either substantiate or refute some of the present opinions that are based entirely on reasoning. This is particularly true of opinions regarding the proper pumping equipment and methods that should be used to secure the best pump performance when handling "frothy" oil or oil containing considerable amounts of gas in solution. With the definite aim of securing additional experimental data along this line, quite an elaborate pump research experiment is now in progress at the University of Oklahoma. Details of this research are given in an article to be published soon in The Oil and Gas Journal.

*Personal communication.
†Robinson, Bruce H., "Economics of Pumping"—A.P.I. Drilling and Production Practice.

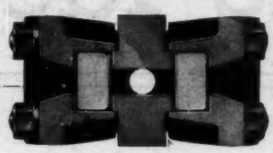
Alike in Quality



PENBERTHY *Reflex*
DROP FORGED STEEL
LIQUID LEVEL GAGES

Liquid shows black—empty space shows white. Preferred wherever liquid level must be easily and positively visible . . . and when liquids are under high pressure or at high temperature.

These gages are made of alloy temperature resisting steel and are the highest quality throughout. Liquid chamber is made from a solid block of steel to assure perfect alignment and rigidity. All Penberthy gages conform with A.P.I.-A.S.M.E. requirements.



PENBERTHY
Transparent
DROP FORGED STEEL
LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures, and/or temperatures. Construction is exceptionally rugged . . . similar to Reflex types.

PENBERTHY INJECTOR CO.

DETROIT, MICHIGAN • Canadian Plant; Windsor, Ontario

PENBERTHY PRODUCTS

Novel Knockout Post Has Safety Features

This simple knockoff post was designed by the lease superintendent and built by the company welder. It is used on a two-well hookup in an Oklahoma field. The lever on the side of the post allows the well to be disconnected without touching the linkage while the small handle welded on the link keeps the pumper's hands out of danger when hooking on the well. Hickory blocks in the 8-in. post hold the bar in alignment; these can be easily replaced.

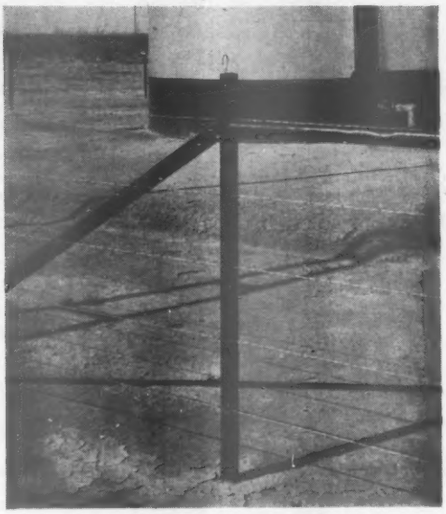
Operating Ideas

Steamer For Paraffin Dissolving

In the not-distant past every lease in the oil country had its supply of steam always available. Today, many leases are operated with no permanent steam-generating facilities whatsoever. On such leases steam is occasionally needed for cleaning paraffin from lead lines or tubing, or for treating a tank of bad oil. The accompanying photograph shows a tire-mounted boiler used primarily for paraffin treatments in West Texas fields. A small trailer compartment behind carries all connections and tools likely to be required in the work undertaken.

Fastening Barbed Wire

Tying barbed wire to the post with a single strand of wire is usually unsatisfactory because the loops slip. The accompanying photograph shows a simple but satisfactory method. Slots are cut horizontally in the post with a torch at the heights chosen for the wires. After the wire has been strung, each strand is put into its respective slot and a wire rod is pushed down through the post in order to holds the strands in the slots.



Mud Mixer Made From Old Hoe

Adopting the potato-masher principle, a welder working at one of Superior Oil Co.'s rigs in the Slaughter field of West Texas made a tool which comes in very handy for mixing admixtures into the drilling mud. A circular grill work was welded onto an old hoe handle. An up-and-down motion is used to mix dry mud and water in a mixing vat.

A vital balancing act put on by two U.O.P. processes

Balancing alkylation stocks

In alkylation, olefin molecules are combined with isoparaffin molecules to produce a saturated compound that is a vital component of 100-octane aviation gasoline

The demand for alkylate is unlimited but its production has been limited because the supply of suitable olefins and of isobutane, the paraffin member of the team, have been limited

Now, the new U.O.P. hydrogen fluoride process greatly increases the olefin supply by alkylating propylenes, and pentylenes, as well as butylenes, either singly or together

And the U.O.P. isomerization process converts butane into isobutane, thus increasing the volume of the paraffin ingredient and bringing it into balance with the olefin supply

No product the refiner can make is more important than alkylate

These two U.O.P. processes make it more efficiently and in greater volume

And every refiner may use them under license from Universal

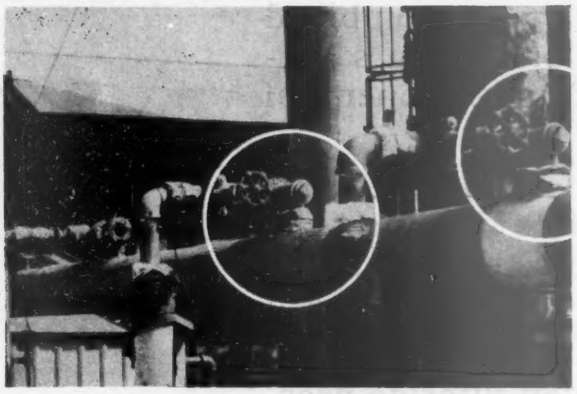
Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

THE REFINERS INSTITUTE OF PETROLEUM TECHNOLOGY

Refinery IDEAS

. . . that save $ $ $



Overhead Taps Aid Steam Distribution

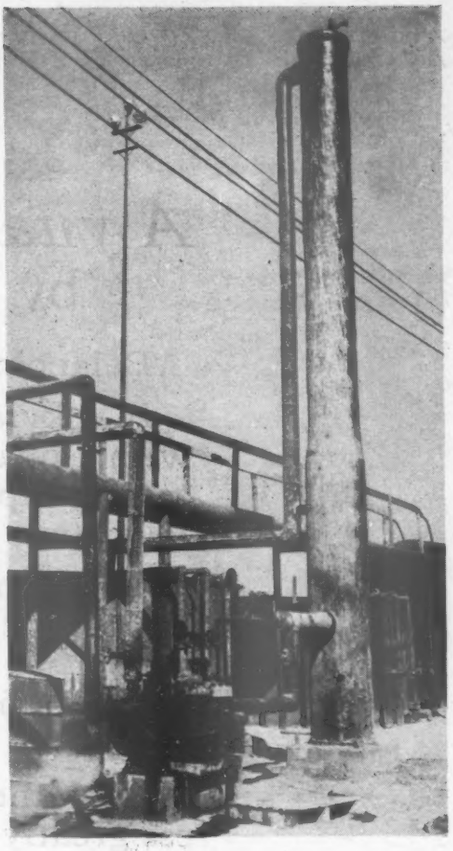
To insure the driest steam from the main being drawn off to power the many small pumps around its refinery, one company makes a practice of tapping all leads into the top of the main, and installing the shutoff valve in the short horizontal run between the ells which bring the line downward to the power unit. Instead of using an ell at the tapped outlet of the steam main, the company uses a tee, set parallel to the main, with a street ell, so as to provide flexibility. Use of the tee also provides a second point for withdrawing steam, should such a course be desired.

Air Trap on Gasoline Line to Treater

Wanting to avoid any chance for air to accompany the stabilized gasoline being continuously treated under pressure, one plant operator has installed a 10-ft. piece of 12-in. pipe in the feed line. It sets on horizontal supports and above ground. The inlet and outlet to the drum are near opposite ends so that maximum opportunity is given any gases or air to rise to its upper portion. Extending from the upper side of the drum and located immediately over the bottom outlet, the operator has located a short vertical drum made from 8-in. pipe. Obviously, any gases will come to the vertical drum.

Recirculate Doctor Solution Over Oxidizing Towers

The spent doctor solution resulting from light-oil treatment must be oxidized or regenerated before it may be used again. This can be effectively accomplished in an oxidizing tower and control for the operation centered in a recirculating system. In the operation shown here a pump takes suction at a point a little above the base of the tower and recirculates the spent solution through the tower. All of the lines and the tower are heavily insulated so that careful control of the final temperature can be maintained. This influences the extent of the conversion and speed with which the solution can be used again.



Raw-Gasoline Stream Heated Before Chemical Treatment

The removal of objectionable sulfur compounds from gasoline is accomplished most effectively in one refinery by giving the raw stream a preheating within a very narrow temperature range. To effect this an ordinary tubular exchanger was set up near the treating plant and the raw gasoline is heated therein by exhaust or live steam, the quantity being determined by the temperature of the raw stock, the outside temperature and the volume to be processed. Experience and laboratory checks easily prescribe the extent of the heating. Obviously, comparatively little heat is needed and the exchanger surface required here was provided within two lengths of 8-in. pipe through which a 2-in. steam line was suspended. This provision also tends to equalize changes in the gasoline temperature due to seasonal influences. If advantageous, cold water could be run through the coil to reduce the gasoline-treating temperature.

WAR *makes it vital to specify Atmospheric Cooling Towers today!**

YOU GET—3 TIMES FASTER COOLING TOWER DELIVERY

THE NATION GAINS—COUNTLESS MAN HOURS AND TONS OF CRITICAL MATERIALS*

Fluor Builds All Types of Cooling Towers

Fluor manufactures both Mechanical Draft types *and* Atmospheric Aerator Cooling-Towers. We hold no brief for *either* type, recognizing only the fact that each type has its own, well-defined field of application. However, in recent years, a largely *"fashionable"* trend has developed toward Mechanical Draft types to the extent that, in approximately 75% of the cases where Mechanical Draft types are being installed, Atmospheric Cooling Towers could have been specified, rendering identical service with identical thermal efficiencies. Under WAR conditions, in the interest of its WINNING, we recommend that specifications be drawn on *fact* rather than *fashion* and, to this end, we offer the services of our engineers who will analyze your specific requirements and submit a recommendation based not on bias but strictly on tower efficiency for the job to be done.

When Atmospheric Cooling Towers are Specified You Make *Vital* War-Time Savings*

The *correct* specification of Atmospheric Cooling Towers in these 3 out of 4 cases will save a substantial percentage of the prime labor required for tower assembly and the secondary labor required for the manufacture of fans, gears, motors, switches, flexible couplings and electric wiring, *as well as the critical materials from which that equipment is made!* In tower operation you will conserve badly needed electric power, gaining at the same time, definite tower operating economies. All these things—man hours, machine hours, critical materials, power and energy— are definite deposits to the account of Victory!

IN 3 CASES OUT OF 4

A FLUOR ATMOSPHERIC AERATOR COOLING TOWER RENDERS SERVICE AND THERMAL EFFICIENCIES IDENTICAL WITH THOSE OF MECHANICAL DRAFT TOWERS...

Atmospheric Deliveries are Three Times Faster

Here is an added advantage—Atmospheric Cooling Tower delivery is 3 times faster than delivery of Mechanical Draft types! This is possible because only Fluor prefabricates and delivers from stock. There is no waiting for delivery of fans, gears, motors, etc. from sub-manufacturers. Prefabrication, product of Fluor standardization, likewise saves erection time and field crews are stationed near your plant ready to erect your tower and place it in operation in the shortest possible time.

*

Get the Facts on Savings Possible

Recently Fluor made a survey comparing the amount of critical materials, man hours, equipment and power energy required for a Mechanical Draft Tower and an Atmospheric Tower of identical capacity. This comparison shows the tremendous savings possible and the facts have been published in a special bulletin T-337. All concerned with the specification of cooling towers should have a copy, and yours will be air mailed immediately on request. *Send for it today!*

When to Specify Atmospheric Cooling Towers

Atmospheric Cooling Towers should be specified in all instances except those where space or sub-normal wind conditions make the use of Mechanical Draft Towers imperative. Fluor engineers will gladly survey your needs and recommend the *proper type* tower for your specific needs. Remember, when considering installation of a Cooling Tower, a good basic rule is—*Be Sure With Fluor!*

These views show Prefabrication in our Mill and a Portion of Prefabricated Stock ready for shipment from storage.

FLUOR COOLING TOWERS

ATMOSPHERIC AERATOR AND MECHANICAL DRAFT TYPES

SINCE 1890

THE COOLING TOWER DIVISION OF THE FLUOR CORPORATION LTD.

2500 South Atlantic Boulevard, Los Angeles, Calif.

NEW YORK • PITTSBURGH • KANSAS CITY • HOUSTON

QUESTIONS ON TECHNOLOGY

By W. L. NELSON, Technical Editor

How to Make 91-Octane Gasoline

We wish to produce 91-octane aviation gasoline for the Government from our regular Mid-Continent crude oil which has an octane number of 58. Can we do this, and what troubles will we have?—I. A. B.

The specifications of 91-octane aviation grade gasoline are in part as follows:

Sulfur content	below 0.05%
Vapor pressure	under 7 lb./sq. in.
Gum (accelerated oxygen bomb)	under 6 mg.
Distillation—	
10%	under 167° F.
50%	under 212° F.
90%	under 275° F.
10% plus 50%	over 307° F.
Loss	under 1.5%
Knock rating (Spec. AN-VV-F-746)	over 91
Lead content	under 4 ml.
Acceptible inhibitor	1 lb. per 5,000 gal.

These specifications cannot ordinarily be met except when the gasoline is produced from a high-octane or naphthenic-type of crude oil. In attaining a vapor pressure of only 7 lb. and reducing the distillation loss to 1.5 per cent, the octane number of the gasoline is reduced by several points. The reduction in octane number occurs primarily by the removal of butanes (O.N. of 95) and to some extent of isopentane (O.N. of 90 plus) particularly if a debutanizer is not available for adjusting the front end of the distillation curve.

Normally the sum of the 10 and 50 per cent boiling points does not exceed 307° F. for gasoline from regular crude oils—the 10 per cent point being about 135° F. and the 50 per cent point being less than 170° F. when the octane number of 70 or 73 (clear) is obtained. Even with such an octane number, the gasoline must have an exceedingly good lead susceptibility in order to make 91-octane number with 4 cc. of lead. The use of catalytic desulfurization is useful in increasing the lead susceptibility. Most operators have found that an end point of 240°-270° F. is necessary unless the crude oil is typically naphthenic.

The octane number can usually be improved by reducing the 90 per cent point downward toward 200° F. but in so doing the 50 per cent point is also decreased to such an extent that the 10 plus 50 per cent sum is too low. Thus, reduction of the 90 per cent point requires an increase in the 10 per cent point toward even 167° F.—and the yield of gasoline decreases to the extent of almost vanishing.

There are, of course, more elaborate and expensive methods of gaining octane number such as the separation of isopentane from natural gasoline, the manufacture of branched-chain aromatic hydrocarbons by catalytic processes involving benzene and unsaturated hydrocarbons, or the construction of elaborate fractionation systems by which the low-octane number normal hydrocarbons such as pentane, hexane, heptane or octane may be removed from the gasoline by fractionation. Even though the price now being offered for 91-octane gasoline is high, these expensive processes cannot usually be justified.

The manufacture of 91-octane gasoline from regular Mid-Continent crude oils without the use of special blending agents is not usually possible. However, so few crudes contain suitable 91-octane gasoline and the government requirements for such a fuel are so great that it seems probable that the specifications will have to be modified to some extent. As our main aircraft plants go into full production, it is possible that more 91-octane gasoline will be required than 100-octane fighting-grade gasoline.

Removal of Water From Towers

We are bothered with the operation of our topping tower which contains water. What can we do to get the water out?—D. H.

The distillation of two immiscible liquids in a continuous manner as in a crude-oil topping system is indeed complicated and no very satisfactory method of operation has been devised. Steam has usually caused no trouble in topping towers because the top temperature was high enough (212° F. and up) to cause the steam to pass overhead but when separating narrow boiling-range solvents or in making low end-point aviation gasolines, water tends to accumulate in the tower and no end of erratic operation results. Many refiners have had to resort to such expedients as to collect the gasoline and water as a liquid and then redistill, or to abandon the use of all live steam and to carefully eliminate all water even that in the brine associated with the crude oil. It is possible to draw water from the side of the tower, as in natural-gasoline-plant stills or strippers, but the fractionation under such conditions is usually not adequate.

Although no adequate solution can be suggested, it is possible to analyze the behavior of such towers and indicate why they behave so strangely. In the tabulation given below are shown the kinds of oils that will be found at various temperatures in a fractionating tower that is at gage pressure of 4 lb. per sq. in., and the ratio of water-vapor to oil-vapor at any temperature. It will be noted that a very heavy oil tends to accumulate at the plate that contains most of the water, and that lighter liquid oils are present at lower plates in the tower. Note also that the lower part of the tower is fed with a reflux from the main water tray that is higher boiling than the liquids found below it.

KINDS OF OILS AND AMOUNTS OF WATER IN A CRUDE-OIL TOPPING TOWER

	Vapor pressure		Approximate properties of oil		Ratio of water to oil (approx.)	
Temp. °F.	Water mm.	Oil mm.	Av. B.P. °F.	Gravity A.P.I.	Mol wtr.-mol oil	Gal. wtr.-gal. oil
140	149	818	135	71.5	0.180	0.027
160	244	723	163	67.2	0.338	0.048
180	385	582	196	64.7	0.662	0.088
200	589	378	241	60.0	1.560	0.183
210	733	234	279	55.8	3.130	0.326
220	890	77	353	50.0	11.600	1.08
224	976	0	(Tar or like)		Infinite	Infinite
230	1.075	...	*230	62.8	....	....
260	...	...	*260	59.7	....	....
300	...	...	*300	55.5	....	....
360	...	...	*360	51.2	....	....

*Exact boiling point depends on amount of steam being used.

Thus, it is often possible to obtain low-boiling materials at low trays in the tower and heavy materials at the top. Even the use of additional reflux may give strange results such as to cause the product at the top of the tower to become heavier and heavier.

All of this is of little help but it should be a warning that conclusions about immiscible-system towers cannot be rashly drawn.

Solubility of Air in Oils

Do you have available, or do you know of any literature dealing with the air solubility of petroleum oils? We make rotary displacement pumps and must frequently handle oils that are saturated with air and oil vapors.—M. B. S.

Not much information on the solubility at low pressures of air or gases in oils is available but some help may be found in the following references: Frolich, Tauch, Hogan, and Peer, Ind. Eng. Chem. 23, 548 (1931); Perry's Chem. Engineer's Handbook, pages 560, 995, and 1,000, McGraw-Hill Book Co., Inc. (1934 Edition); Vol. 3 of International Critical Tables, page 257, McGraw-Hill Book Co., Inc.; Handbook of Chemistry and Physics, Nineteenth Edition, page 830; and Goodman and Krase, Ind. Eng. Chem., 23, 401 (1931). Much work is available at higher pressures (250-5,000 lb. per sq. in.), mainly that of Sage, Lacey, and their coworkers at the California Institute of Technology, but such information is hardly applicable to most commercial pumping situations.

The solubility of gases in liquids is governed by Henry's law which states that the ratio of the partial pressure of the gas in the gas phase to the mol fraction of the gas in the liquid is a constant.

pp. in gas phase = constant x mol fraction in liquid

In the ideal case the kind of solvent or oil has no effect on the constant and this is substantiated in some degree by Table 1. The failure of pentane to behave perfectly is probably due to the fact that it exerts a sizable vapor pressure at a temperature of 77° F. Thus, if the value of Henry's law constant is obtained from any source (such as Perry's Handbook or Handbook of Chem. and Physics), the entire range of solubility with pressure can be computed for that temperature. The law is not accurate if a chemical reaction occurs between the gas and the liquid.

TABLE 1—SOLUBILITY OF OXYGEN IN OILS
(cc. per liter)

Partial pressure, mm.	In gas oil at 77° F.	Transformer oil at 77° F.	Paraffin oil at 65° F.	Kerosene at 65° F.	Pentane at 77° F
100	20.3	20.5	15	20.9	76
400	81	82	60	83.7	304
760	154	156	114	159	576
1,560	380	312	228	318	1,152
3,800	770	780	570	795	2,880
7,600	1,540	....	....	....	5,760
53,200	10,780	....	....	....	....

The effect of an increase in temperature on the solubility of gases is to decrease their solubility but it is necessary to have experimental data on the rate of change of Henry's constant with temperature for each particular gas.

Although the solubility of gases in oils is not greatly affected by the kind of oil, it should not be inferred that the rate of disengagement of bubbles from the oil is independent of the kind of oil. The foaming tendency is definitely different for various oils, particularly for very viscous oils.

PLUS
PRODUCES
X

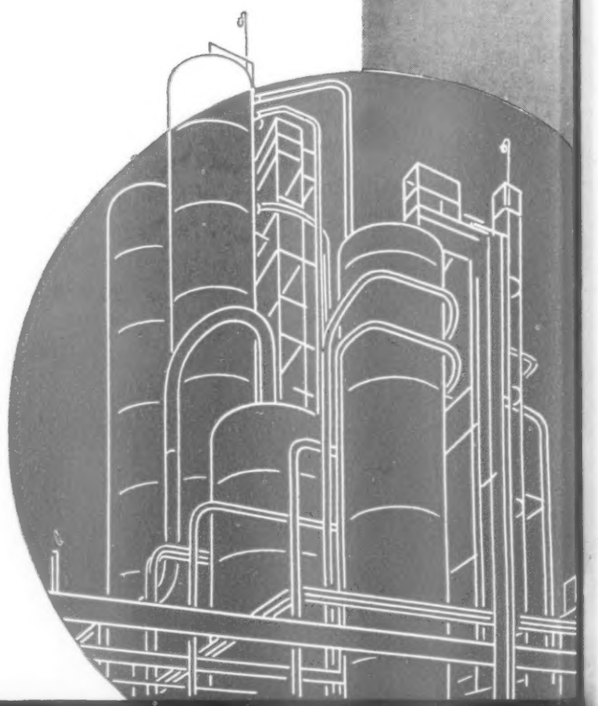
LUMMUS
is building . . . .

A large percentage of the projected
BUTADIENE CAPACITY*

A large proportion of the projected
STYRENE PLANTS*

These products are polymerized into
SYNTHETIC RUBBERS

Now under construction are eight Lummus Thermofor Catalytic Cracking plants employing eighteen reactors and producing Butane-Butylene raw material for Butadiene plants. In addition, these Lummus T. C. C. plants will produce aviation base stock, and B-B stock for aviation alkylate.



★ **Restrictions in the public interest prohibit the publication of contract figures or locations or capacities of plants under construction.**

THE LUMMUS COMPANY, 420 Lexington Avenue, N. Y.
600 So. Michigan Avenue, Chicago, Ill.
2315 Tangley Road, Houston, Tex. Florida, 671, Buenos Aires, Argentina
70 Barn Hill, Wembley Park, Middlesex, England

LUMMUS
PETROLEUM REFINING PLANTS

CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

RIG OPERATION

JUNE 11, 1942

TABLE OF EQUIVALENT COSTS FOR BOILER FUELS

AT wildcat locations fuel is always a matter of some concern. Usually, if a steam rig is used, any one of several types of fuels can be supplied at the location, but in each case the price is high. In the accompanying table boiler fuels are compared as to relative value per unit of measure. Along any horizontal line of the table the comparative worth of fuels can be read. Thus if oil is worth $1 per barrel the table shows that natural gas on the same basis would be worth 18.67 cents per 1,000 cu. ft.; coal would be worth $4.42 per ton, and wood would be worth $4.07 per cord.

Example of use of table. — A contractor is to drill a well at a wildcat location where oil suitable for firing boilers can be purchased at $1.30 per barrel. A gas company offers to supply him with natural gas at 20 cents per 1,000 cu. ft. He wishes to determine immediately which will result in the lower fuel bill.

Solution.—In the "oil" column the figure 1.300 is found. Opposite this in the gas column appears the figure 0.2425. This means that the contractor will receive as much fuel value for his money in paying 24¼ cents per 1,000 cu. ft. for gas as he would in paying $1.30 per barrel for oil. He therefore contracts to buy natural gas at 20 cents per 1,000 cu. ft.

Example 2.

An oil company undertakes drilling on foreign shores where the only fuels available are wood and coal. Coal can be bought for $10 per ton including delivery, while it will cost $8 per cord to have wood cut on the lease and hauled to the boilers.

Solution.—In the "coal" column the figure 10.00 is found. Opposite this in the "wood" column is the figure 9.210, meaning that wood at $9.21 per cord is equivalent in value to coal purchased at $10 per ton. In this case the price differential between the two fuels may not be sufficient to make advisable the use of wood at $8 per cord, since it would probably be necessary to use larger fireboxes for efficient combustion of the wood. (*Note*: The figures in the table are for woods comparable in fuel value to red oak, which weighs approximately 4,000 lb. per cord. For lighter or heavier woods the fuel is, in most cases, roughly proportional to the weight.

This is the second of a series of Equivalent Cost tables to be included as a part of this feature. The first table was presented in the May 28, 1942, issue.

TABLE OF EQUIVALENT COSTS FOR BOILER FUELS

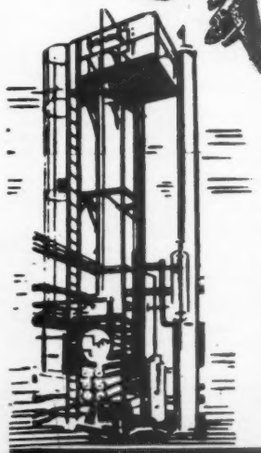
Price				Price			
Oil, 32 gravity* (barrel)	Natural gas† (M.c.f.)	Coal, soft‡ (short ton)	Wood, oak§ (cord)	Oil, 32 gravity* (barrel)	Natural gas† (M.c.f.)	Coal, soft‡ (short ton)	Wood, oak§ (cord)
$.0268	$.0050	$.1182	$.1090	1.450	.2708	6.420	5.900
.0536	.0100	.2363	.2181	1.478	.2754	6.500	6.000
.1072	.0200	.4738	.4363	1.501	.2800	6.525	6.106
.1610	.0300	.7100	.6548	1.500	.2801	6.527	6.104
.2000	.0373	.8838	.8142	1.550	.2892	6.848	6.300
.2145	.0400	.9462	.8730	1.555	.2900	6.858	6.320
.2270	.0423	1.000	.9225	1.600	.2982	7.045	6.500
.2500	.0466	1.103	1.017	1.610	.3000	7.100	6.540
.2681	.0500	1.183	1.090	1.650	.3080	7.291	6.710
.3000	.0560	1.327	1.221	1.660	.3100	7.342	6.755
.3220	.0600	1.420	1.309	1.700	.3175	7.518	6.915
.3500	.0653	1.546	1.423	1.713	.3200	7.575	6.975
.3700	.0700	1.657	1.528	1.723	.3215	7.580	7.000
.4000	.0746	1.766	1.628	1.750	.3266	7.740	7.125
.4295	.0800	1.891	1.745	1.768	.3300	7.818	7.190
.4500	.0839	1.984	1.830	1.800	.3360	7.951	7.325
.4825	.0900	2.128	1.962	1.812	.3379	8.000	7.360
.5000	.0932	2.205	2.034	1.820	.3400	8.050	7.410
.5360	.1000	2.363	2.181	1.846	.3440	8.115	7.500
.5500	.1027	2.431	2.238	1.850	.3455	8.172	7.525
.5900	.1100	2.608	2.388	1.875	.3500	8.285	7.625
.6000	.1120	2.648	2.441	1.900	.3546	8.400	7.735
.6151	.1148	2.710	2.500	1.926	.3592	8.500	7.830
.6445	.1200	2.840	2.617	1.928	.3600	8.528	7.850
.6500	.1212	2.870	2.642	1.950	.3641	8.620	7.940
.6782	.1267	3.000	2.760	1.970	.3672	8.662	8.000
.6970	.1300	3.080	2.832	1.981	.3700	8.760	8.062
.7000	.1308	3.095	2.848	2.000	.3738	8.848	8.148
.7366	.1376	3.244	3.000	2.035	.3800	9.000	8.280
.7590	.1400	3.315	3.053	2.050	.3826	9.060	8.345
.7890	.1479	3.500	3.220	2.088	.3900	9.232	8.500
.8000	.1493	3.538	3.257	2.100	.3920	9.280	8.545
.8050	.1500	3.552	3.268	2.141	.4000	9.462	8.720
.8500	.1588	3.759	3.460	2.150	.4020	9.520	8.755
.8580	.1600	3.787	3.484	2.195	.4100	9.700	8.945
.8620	.1607	3.792	3.500	2.200	.4110	9.725	8.955
.9000	.1680	3.979	3.660	2.217	.4130	9.750	9.000
.9060	.1690	4.000	3.681	2.248	.4200	9.942	9.150
.9120	.1700	4.025	3.702	2.250	.4202	9.982	9.155
.9500	.1774	4.200	3.863	2.266	.4225	10.00	9.210
.9650	.1800	4.260	3.921	2.300	.4290	10.17	9.350
.9890	.1836	4.332	4.000	2.305	.4300	10.19	9.370
1.000	.1867	4.418	4.068	2.350	.4385	10.37	9.550
1.019	.1900	4.500	4.140	2.358	.4400	10.42	9.585
1.050	.1960	4.642	4.270	2.400	.4480	10.61	9.765
1.072	.2000	4.738	4.363	2.409	.4500	10.76	9.810
1.100	.2055	4.862	4.480	2.450	.4580	10.84	9.980
1.109	.2063	4.780	4.500	2.458	.4590	10.85	10.00
1.127	.2100	4.970	4.575	2.461	.4600	10.86	10.02
1.132	.2113	5.000	4.609	2.500	.4665	11.03	10.16
1.150	.2150	5.090	4.682	2.550	.4762	11.25	10.39
1.180	.2200	5.210	4.797	2.600	.4851	11.46	10.57
1.200	.2240	5.305	4.880	2.650	.4950	11.70	10.79
1.230	.2295	5.412	5.000	2.700	.5045	11.90	10.98
1.232	.2300	5.448	5.010	2.750	.5140	12.13	11.20
1.245	.2321	5.500	5.060	2.800	.5235	12.36	11.40
1.250	.2335	5.530	5.082	2.850	.5325	12.58	11.60
1.287	.2400	5.681	5.230	2.900	.5418	12.69	11.80
1.300	.2425	5.748	5.285	2.950	.5510	13.01	12.00
1.340	.2500	5.920	5.450	3.000	.5600	13.22	12.20
1.350	.2520	5.962	5.488				
1.355	.2523	5.965	5.500				
1.360	.2537	6.000	5.525				
1.393	.2600	6.151	5.660				
1.400	.2618	6.195	5.700				
1.448	.2700	6.388	5.885				

*5,901,000 B.t.u. per 42-gal. barrel.
†1,100,000 B.t.u. per 1,000 cu. ft.
‡26,000,000 B.t.u. per short ton.
§24,000,000 B.t.u. per cord, 4,000 lb.

Facts Worth Knowing . . . . by THE GIRDLER CORPORATION

GIRBOTOL PROCESS

helps 'em fly higher AND faster



HOW GIRBOTOL AIDS IN PRODUCTION OF HIGH OCTANE GASOLINE

Before POLYMERIZATION and ALKYLATION, the GIRBOTOL Process helps increase the octane rating by removing H_2S from the hydrocarbon feed.

With Girbotol purification of the feed, a greater increase in lead susceptibility is obtained as compared to expensive after-treatment of the product.

Many feed stocks contain ammonia—a catalyst poison which is effectively removed by the Girbotol Process, thus increasing catalyst life.

In the HYDROGENATION process for obtaining high octane number motor fuels, raw hydrogen is produced by a modified water gas reaction involving catalytic reforming of hydrocarbons with steam.

Girbotol Process removes CO_2 from the raw product to produce pure hydrogen.

You are urged to consider the application of this efficient and economical process to your needs. Girdler engineers will be glad to study your purification problem. Write for further information.

GIRBOTOL PROCESS is a simple, cyclic process for the separation of acidic constituents from gaseous mixtures. In cycle and equipment the process is similar to gasoline absorption. For further information on this economical, efficient purification process used in more than 115 plants today, write to:
THE GIRDLER CORPORATION (Gas Processes Division) LOUISVILLE, KY.

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 20

JUNE 11, 1942

GAS FLOW IN SERIES LINES

IN calculating flow through a series of pipes of different diameter, a convenient method consists of calculating the lengths of some arbitrarily selected diameter that are equivalent to the various segments of which the series system is composed and adding these lengths together to obtain a simple pipe line of uniform diameter which is equivalent to the series line.

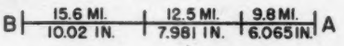
It is easily shown from Weymouth's formula that the relationship between the equivalent lengths and diameters of two pipes is expressed by the following equation:

$$\frac{d_1^{5.33}}{L_1} = \frac{d_2^{5.33}}{L_2} \qquad (1)$$

where d_1 and L_1 represent the diameter and length respectively of one line and d_2 and L_2 represent the diameter and length respectively of the other line.

Example 1.

Problem:



Given the series pipe line shown in the sketch and other data as follows:

Pressure at A = 575 lb. per sq. in., abs.
Pressure at B = 65 lb. per sq. in., abs.
Specific gravity of gas = 0.72
Flowing temperature = 75° F.

Calculate rate of flow of gas, standard cubic feet per 24 hours. (Standard conditions are 14.7 lb. per sq. in., abs., and 60° F.)

Solution.—Select any one of the three lines making up the series and find the equivalent lengths of the other two lines in terms of the same diameter.

Selecting 7.981 in. as the equivalent diameter, the equivalent lengths of the other two sections are found as follows: (Let subscript 1 in each case represent the equivalent line.)

Transposing Equation 1 to solve for L_1,

$$L_1 = L_2 \left(\frac{d_1}{d_2}\right)^{5.33} \qquad (2)$$

For convenience in using values of $d^{2.667}$ from Table 1, Installment 17, Equation 2 may be written as

$$L_1 = L_2 \left(\frac{d_1^{2.667}}{d_2^{2.667}}\right)^2 \qquad (3)$$

Then for the section of 10.02-in. pipe the equivalent length in terms of 7.981-in. pipe would be

$$L_1 = 15.6 \left(\frac{254.5}{467.0}\right)^2 = 4.63 \text{ miles}$$

The equivalent length of the 6.065-in. section of pipe in terms of 7.981-in. pipe would be

$$L_1 = 9.8 \left(\frac{254.5}{122.4}\right)^2 = 42.36 \text{ miles}$$

The equivalent of the whole series then would be, 4.63 + 12.5 + 42.36, or 59.49 miles of 7.981-in. pipe.

Substituting in Weymouth's equation for a simple line (see Installment 17):

$$Q = 15302 \times 7.981^{2.667} \times \left[\frac{(575)^2 - (65)^2}{59.49 \times 0.72 \times (460 + 75)}\right]^{1/2}$$

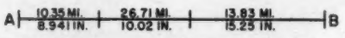
Solving,

Q = 14,720,000 std. cu. ft. per 24 hr.

Example 2.

Problem:

A series line with lengths and internal diameters of the various sections is shown in the sketch. The



10.020-in. section of the line has been in use for several years and is in poor condition. It is also desired to increase the delivery capacity from A to B to 1.3 times the present capacity without changing either the input or outlet pressure. With what size of pipe must the 10.020-in. pipe be replaced to accomplish the desired result?

Solution.—Calculate first the equivalent length of the series in terms of any arbitrarily chosen diameter. This equivalent diameter will be chosen as 8.941-in.

Applying Equation 3, the equivalent length of the 10.020-in. section in terms of 8.941-in. pipe would be

$$L_1 = 26.71 \left(\frac{344.6}{467.0}\right)^2 = 14.55 \text{ miles}$$

The equivalent length of the 15.250-in. section in terms of 8.941-in. pipe would be

$$L_1 = 13.83 \left(\frac{344.6}{1431}\right)^2 = 0.804 \text{ miles}$$

Then, the equivalent length of the series in terms of 8.941-in. pipe is 10.35 + 14.55 + 0.804, or 25.704 miles.

Let Q = present capacity of line, standard cubic feet per 24 hours; and Q_2 = desired capacity of line, standard cubic feet per 24 hours. By the conditions of the problem,

$$Q_2/Q_1 = 1.3$$

By consideration of Weymouth's equation, it can be shown that the relation between delivery capacity of two lines (either actual or equivalent) of the same diameter is equal to the square root of the inverse ratio of the lengths.

Then

$$\frac{Q_2}{Q_1} = \left(\frac{L_1}{L_2}\right)^{1/2} = 1.3$$

Where L_1 is the present equivalent length of the given system in terms of 8.941-in. pipe and L_2 is the equivalent length of the system in the same size of pipe after making the proposed change.

Substituting, squaring both sides, and solving for L_2,

$$L_2 = \frac{25.704}{(1.3)^2} = 15.21 \text{ mi. of 8.941-in. pipe}$$

The two sections of pipe that are not to be replaced are equivalent to 10.35 + 0.804, or 11.154 miles of 8.941-in. pipe.

Then the line to replace the 10.020-in. pipe must be equivalent to 15.21 — 11.154, or 4.056 miles of 8.941-in. pipe and have an actual length of 26.71 miles.

In Equation 3, let subscript 1 represent the equivalent line and subscript 2 represent the actual line. Transpose in order to solve for the unknown d_2, and the equation is

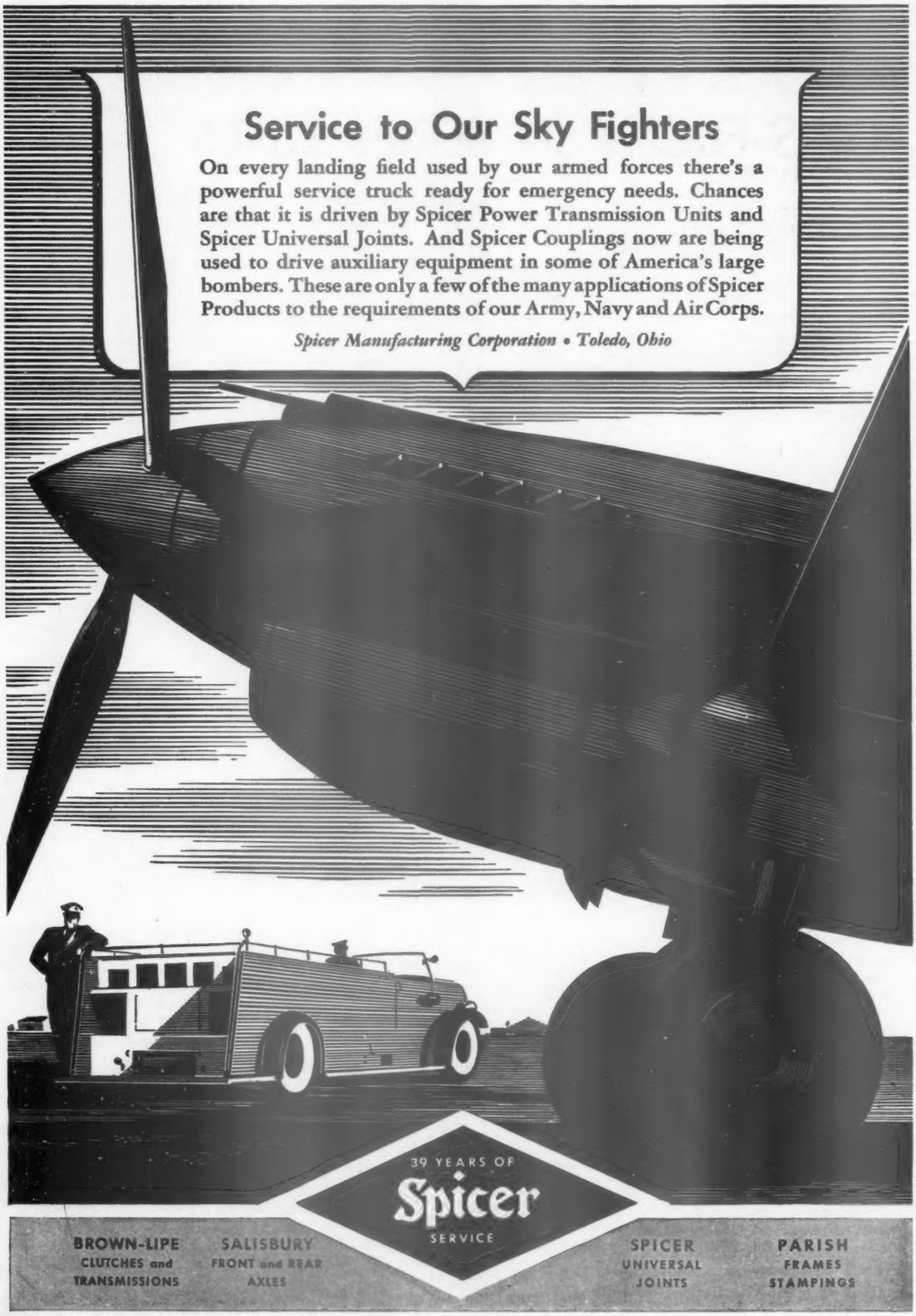
$$d_2^{2.667} = d_1^{2.667} \left(\frac{L_2}{L_1}\right)^{1/2}$$

Substituting,

$$d_2^{2.667} = 8.941^{2.667} \left(\frac{26.71}{4.056}\right)^{1/2}$$
$$= 344.6\ (6.585)^{1/2}$$
$$= 344.6 \times 2.566 = 884.2$$

Looking at the values of $d^{2.667}$ in Table 1, Installment 17, it is found that a value of 884.2 corresponds to a value of d of 12.73 in. The next available pipe size above the calculated internal diameter of 12.73 in. would be appropriate. Examination of a pipe catalog indicates that 14-in. o.d., (13.25-in. i.d.) could be used in so far as a consideration of capacity is concerned.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma


Service to Our Sky Fighters
On every landing field used by our armed forces there's a powerful service truck ready for emergency needs. Chances are that it is driven by Spicer Power Transmission Units and Spicer Universal Joints. And Spicer Couplings now are being used to drive auxiliary equipment in some of America's large bombers. These are only a few of the many applications of Spicer Products to the requirements of our Army, Navy and Air Corps.
Spicer Manufacturing Corporation • Toledo, Ohio
39 YEARS OF
Spicer
SERVICE
BROWN-LIPE
CLUTCHES and
TRANSMISSIONS
SALISBURY
FRONT and REAR
AXLES
SPICER
UNIVERSAL
JOINTS
PARISH
FRAMES
STAMPINGS

Journalog

A BIWEEKLY FEATURE OF THE OIL AND GAS JOURNAL

No. 8

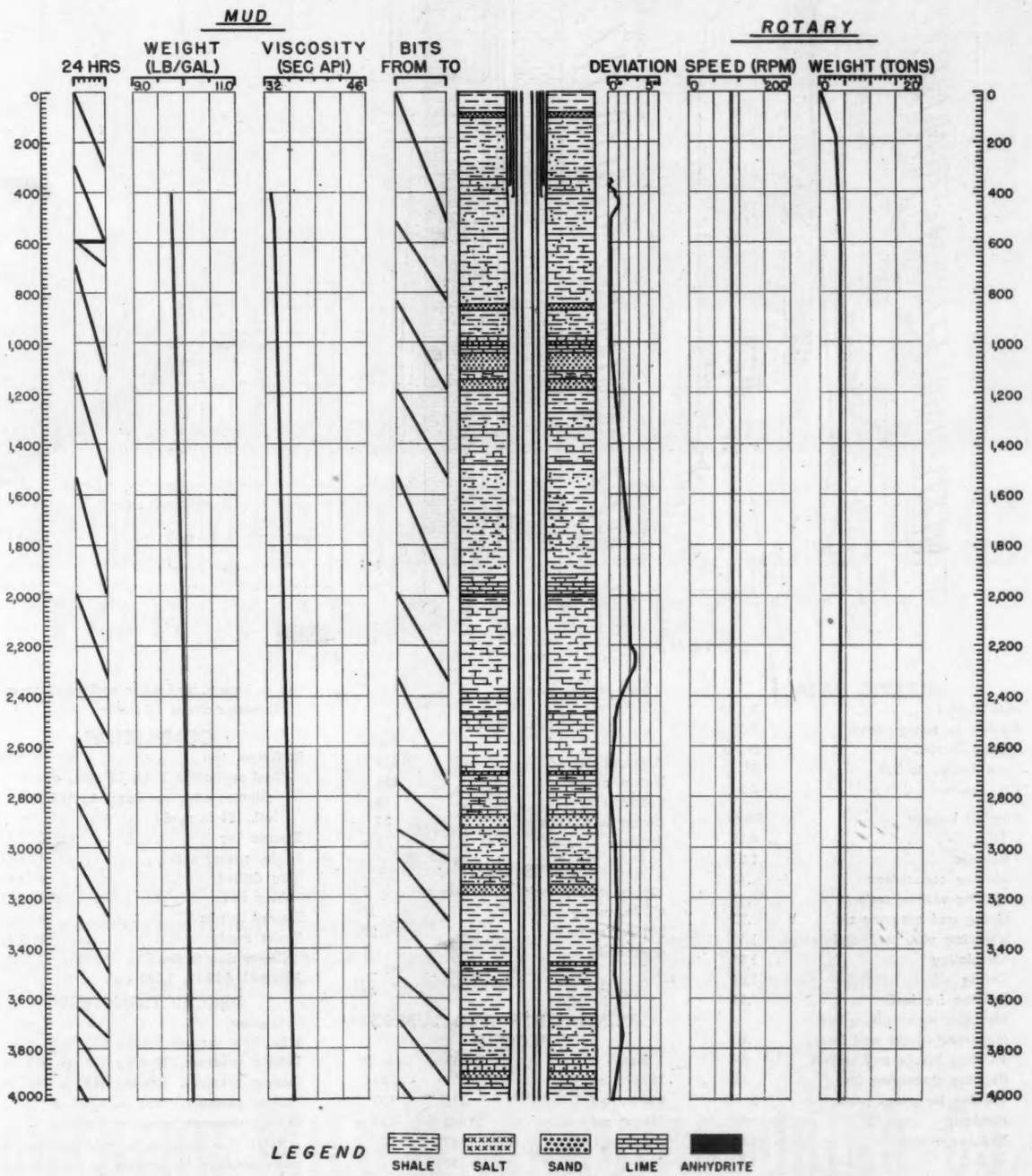
JUNE 11, 1942

TAUBERT, McKEE, AND SINCLAIR PRAIRIE 1 BOYD

660 FT. S FROM N LINE; 660 FT. W FROM E LINE OF ABST. 258, SETH M. HAZEL SUR. (R. E. and J. F. Boyd)

TAUBERT & McKEE
CONTRACTOR

Discovery Well, Unnamed Pool, Jack County, Texas

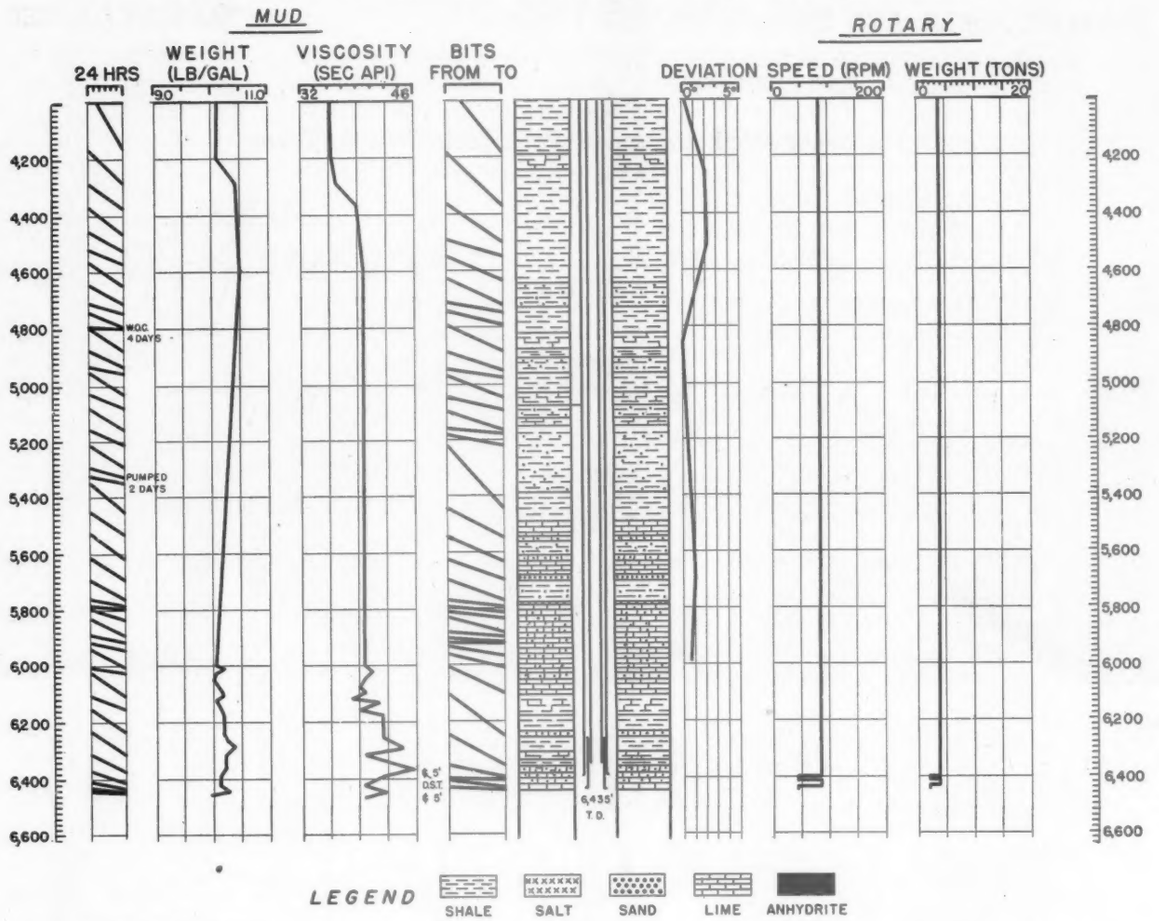


(Continued on Next Page)

Journalog

A BIWEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Discovery Well, Unnamed Pool, Jacks County, Texas (Continued)



DRILLING DATA

Date started	2-1-42
Rigging up rotary, days	2.5
Drilling started	2-3-42
Days drilling to T.D.	62
T.D. reached	4-6-42

Time off bottom:	Days
Trips	4.85
Repairs	1.71
Making connections	.62
Making vertical tests	.17
Oiling and greasing rig	.73
Cleaning pits, mud and jetting	1.62
Circulating	1.03
Coring	1.02
Waiting for fuel	.58
Installing new drilling line	.37
Inspecting blocks and line	.08
Painting blocks and swivel	.04
Running measuring line	.03
Waiting for pump parts	2
Blackout	.02
Running casing	1.83
W.O.C.	4.00
Total	20.70
Net drilling time	41.3

MUD USED

	Sacks
Aquagel	116
Native clay	396
Special clay	10
Cotton seed hulls	35
Jelliflake	9½

BITS USED

12¼-in. rotary rock	1
9⅝-in. rotary rock	19
7⅞ rotary rock	28
Corehead	1
Total	49

CASING, LINER AND TUBING RECORD

Size—	Depth	Cement
10¾-in. o.d.	370	200
8⅝-in. o.d.	417	100
5½-in. o.d.	*6,388	200
4½-in. o.d.	†187	...
2-in.	6,350	...

*1,500 ft. of 15 lb.; 4,888 ft. of 14 lb.

†Set on bottom at 6,435 ft. and cemented top to bottom, and later perforated to exclude water above oil strata.

COMPLETION

Drill-stem test	4- 6-42
(Tool on bottom 1 hr. 15 min., gas in 8 minutes after opening; showed 225 ft. oil, 195 ft. mud.)	
Electric log	4- 7-42
5½-in. casing set	4-12-42
Plug drilled	4-15-42
Tubing run	4-16-42
Flowed in pits	4-16-42
Tanks ready	5- 3-42
(Delay due to flood)	

Acidized 4-19-42, 1,000 gal.

PRODUCTION TEST

First gage 5-4-42

8 hr. flow through tubing 226 bbl.

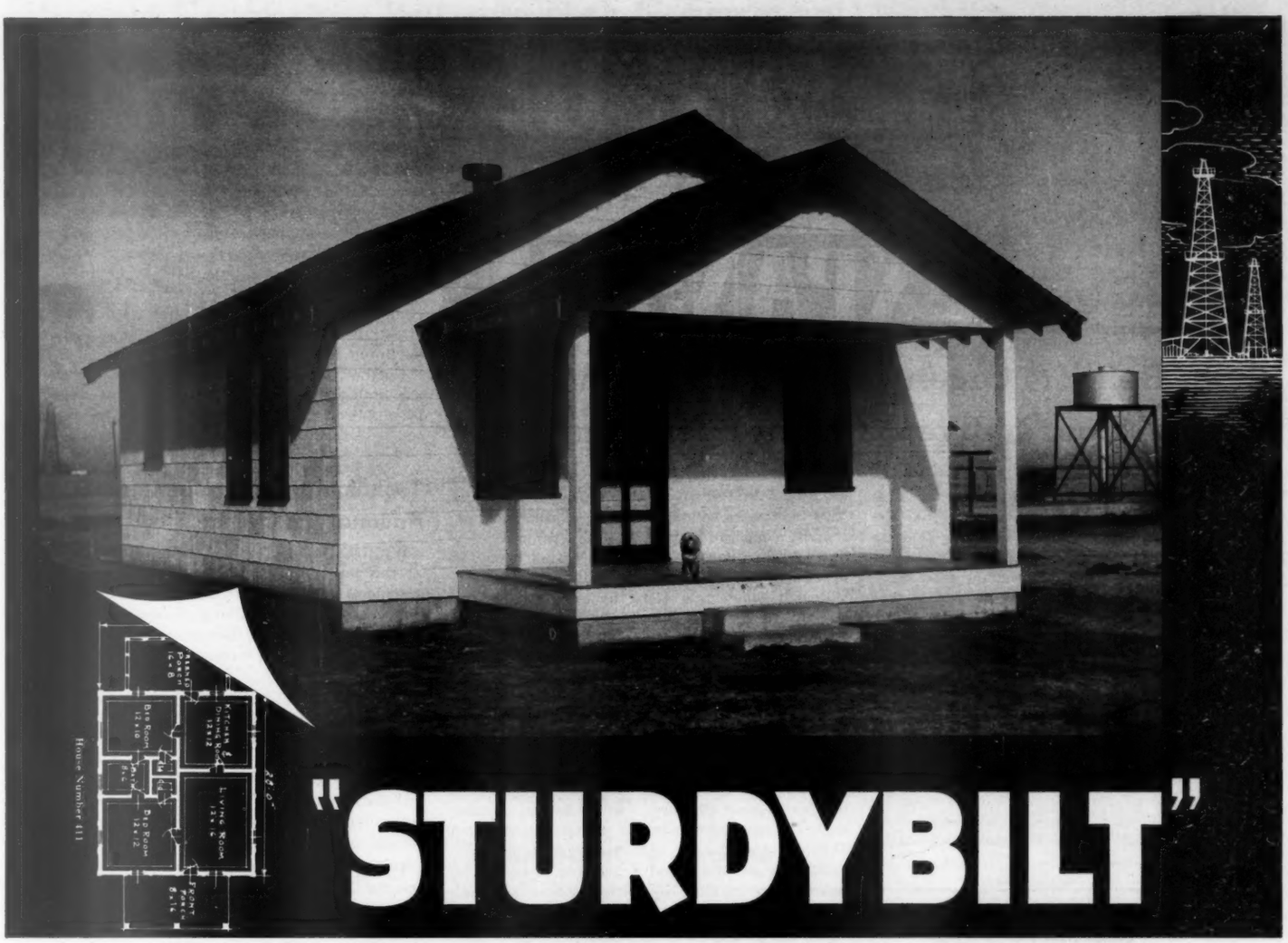
Tubing pressure, flowing 150 to 920 lb.

Casing pressure, flowing 460 to 980 lb.

Tubing pressure, shut in 1,100 lb.

Casing pressure, shut in 1,000 lb.

Note: The well at present is shut in while waiting for cement to set around 4½-in. liner. Liner will be perforated to bring in well without water production.



Sectional Houses
FOR THE OIL INDUSTRY

"STURDYBILT" took the canvas out of oil field camps. They can be speedily and economically erected at temporary or permanent locations. **"STURDYBILT"** houses provide attractive, comfortable and conveniently arranged living quarters.

These factors of value cannot be discounted in setting-up an oil field housing program — **Prefabrication** cuts erection time from days or weeks to only hours — **One Billing** covers all costs — **Standardization** of designs assures better houses at lower costs — **Demountability** provides high salvage, there is very little capital loss if houses have to be moved to a new location.

OIL FIELD TYPES — all practical and each designed to fill a specific housing requirement: Residences, one, two, three, four and five rooms; Boarding and Bunk Houses; Recreation Halls, Warehouses and Field Offices, Garages and small buildings. Floor plans, together with quotations, will be sent promptly upon request.

SOUTHERN MILL & MANUFACTURING CO.

Wichita, Kansas **TULSA, OKLAHOMA** Longview, Texas

REFINERY ACTIVITY AND EXPANSION

Eight Refiners Organize to Construct and Operate Cooperative Aviation-Fuel Plant

EIGHT independent refining companies operating in southern Oklahoma and North Texas have organized a new company, Associated Refineries, Inc., which, as agent for the Defense Plant Corp., will build and operate a new installation for production of 100-octane gasoline.

The new aviation-gasoline refinery will cost approximately $10,000,000. The plant will be located in southern Oklahoma, dependent upon certain available facilities such as land, water and other conditions.

The Associated Refineries' installation will be one of the first cooperative units undertaken by independent refiners in a program approved by the Office of Petroleum Coordinator by which charging stock is to be drawn from several small plants and processes in a central unit for recovery of war materials. The plant will incorporate catalytic cracking of gas oil, dehydrogenation and alkylation.

OPERATIONS OF STOCKHOLDERS IN ASSOCIATED REFINERIES, INC.

Company and plant location—	Crude-oil capacity (bbl. daily)	Cracked gasoline capacity (bbl. daily)
Anderson-Prichard, Cyril, Okla.	8,000	3,000
Bell Oil & Gas, Grandfield, Okla.	5,000	1,250
Ben Franklin, Ardmore, Okla.	4,500	1,300
Cosco Oil Co., Wynnewood, Okla.	3,000	575
La Salle, Burkburnett, Tex.	2,500	...
Panhandle, Wichita Falls, Tex.	4,000	960
Rock Island, Duncan, Okla.	8,000	2,500
W. T. Waggoner, Electra, Tex.	4,000	900
Total capacities	39,000	10,485

M. L. Freese, vice president of the Bell Oil & Gas Co., Tulsa, is president of the new corporation, Associated Refineries, Inc. Other officers are: L. B. Simmons, Rock Island Refining Co., Duncan, Okla., chairman; Roy B. Jones, Panhandle Refining Co., Wichita Falls, Tex., R. B. Anderson, W. T. Waggoner Estate, Vernon, Tex., and B. I. Lubell, Bell Oil & Gas Co., vice presidents. H. B. Alspaugh, Duncan, Okla., is secretary and treasurer and I. A. Anson, Tulsa, and C. D. Lund, Duncan, Okla., assistant secretaries.

Refiners who are stockholders in the Associated Refineries, Inc., are as follows: Anderson-Prichard Oil Corp., Cyril, Okla.; Ben Franklin Refining Co., Ardmore, Okla.; Bell Oil & Gas Co., Tulsa; Cosco Oil Co., Wynnewood, Okla.; La Salle Petroleum Corp., Burkburnett, Tex.; Panhandle Refining Co., Wichita Falls, Tex.; Rock Island Refining Co., Duncan, Okla.; and W. T. Waggoner Estate, Vernon, Tex.

All of the above refiners have contracted with the Associated Refineries, Inc., to supply materials to the new refinery. The refineries involved process approximately 30,000 bbl. per day of crude oil, thus affording market to producers in the area in which each refiner is presently taking oil.

The new refining program is arranged so as to result in the manufacture of considerably less motor gasoline at all of the participating plants, thus tending to relieve a distressed condition and thereby cooperating with the Government in reducing the quantities of motor fuel while increasing the yield of burning oils.

Design contract is being awarded to the Universal Oil Products Co., Chicago. Frick-Reid Supply Co., Tulsa, will handle the entire construction job on a turnkey-contract basis.

●

Benzene Use in Motor Fuel Prohibited by Order M-137

WASHINGTON, D. C.—Benzene was placed under complete allocation control by the issuance today of an amendment of Conservation Order M-137 by the director of industry operations.

Because of the rapidly growing demand for benzene in making aviation gasoline, synthetic rubber, phenol for plastics, and aniline for the high explosive tetryl, it is deemed necessary to prohibit delivery or acceptance of any benzene after July 1, 1942, except by specific authority of the director of industry operations. Quantities of 50 gal. or less to one person in one month are excepted.

Persons seeking delivery of benzene and producers seeking to use benzene must make application on Form PD-223-A. Buyers are charged with the responsibility of certifying to their suppliers that they are complying with the order. Both producers and distributors must file Form PD-224-A, as instructed by the director of industry operations.

Subject to the provisions of General Preference Order M-34 (Toluene), producers of benzene must operate their equipment to obtain the maximum possible quantity of 2° benzene. The director of industry operations may from time to time direct that maximum production of benzene of some other grade be produced. Sale is permitted of coal-tar derivative oils (petroleum oil not included) containing benzene only when the purchaser is prepared and equipped to extract the maximum amount of benzene possible.

Further provisions of the order prohibits the use of benzene as a motor fuel, either pure or in mixture, or its sale when the seller has reason to suspect that it may be so used.

Technical Data Available on National Emergency Steels

WASHINGTON, D. C.—Technical information on the National Emergency Steels is accumulating and is available to industry, it was announced last week by the Metallurgical Section, Iron and Steel Branch, and the Bureau of Industrial Conservation, which are cooperating on the proposed new specifications.

Increasing use of the steels has made them more readily available at mills and warehouses and numerous tests have been made. In addition, steel companies have been making physical tests on the new steels as they are produced. Some of the tests have been made on single heats, but others have been made on several sizes and after various heat treatments.

To make the information available to industry, the Iron and Steel Institute has collected all existing data and published them in loose-leaf form. Included are curves showing the hardenability characteristics of all NE steels and the mechanical properties of a number of the compositions. Present data will be supplemented from time to time as testing of the steels continues.

National emergency steels are made in accordance with new specifications designed to conserve scarce alloying elements.

Sketches of Plant Operators . . .

HINES H. BAKER, vice president in charge of all manufacturing operations and a director of Humble Oil & Refining Co., Houston, Tex., probably will have no worries about what to do with his spare time during the next year or so. In fact, Mr. Baker, one of the hardest working top executives of any refinery organization, will be busier than ever directing phases of the $43,000,000 synthetic-rubber program that his company last week agreed to build and operate for the Government. Humble is already one of the largest producers of 100 and 91-octane aviation gasoline and, late last year, completed and started operations on a 10-million-dollar plant for recovery of toluene.

Direction of Humble's extensive refinery operations, which include four plants with aggregate crude capacity of 230,600 bbl. daily, was assigned to Mr. Baker in the latter part of 1940 when he succeeded Stuart A. Giraud, deceased. Mr. Baker rose to a high position with Humble through the legal department which he joined in 1919 after being discharged as a lieutenant of artillery in the first World War. Ramifications of modern refinery processing with its intricate structure of patents has furnished Mr. Baker with abundant opportunity to continue use of his legal talents.

Negotiations between Humble and government agencies culminating last week in the contract providing for company erection and operation of a butadiene and butyl rubber plant have been under way for 1½ years with Mr. Baker handling much of the detailed work. Mr. Baker was born in Mills County, Texas, in 1893. He attended the University of Texas at Austin, receiving both his B.A. and law degrees from that institution.

Humble Negotiates Contracts With Government For Two Rubber Plants Costing $43,000,000

HOUSTON, Tex.—Humble Oil & Refining Co. last week closed contracts for the construction of a butyl-rubber plant for the Government at an estimated cost of approximately $16,000,000. Upon completion this plant will be leased by the Humble company and will be operated by it under a contract with Rubber Reserve Co., a subsidiary of Reconstruction Finance Corp.

This arrangement covers the second plant to be operated by Humble for the Government in connection with the production of synthetic rubber. The first plant, which likewise involved investment by the Government of approximately $16,000,000, is for the production of butadiene, which is an ingredient of synthetic rubber of the buna type. The total investment to be made both by Humble and the Government in these projects will aggregate approximately $43,000,000. A portion of the investment will be made by Humble in the refinery for the production of the raw materials to be supplied by the company in connection with the manufacture of butyl rubber and butadiene.

Butyl is one of the newer types of synthetic rubber. The process for its manufacture from petroleum was developed by Standard Oil Development Co., and has been made available to prospective manufacturers on a royalty-free license basis for duration of the war. Butyl rubber is unusually resistant to heat and aging, and is therefore particularly useful for insulation of electric wires, impregnation of balloon cloth, and in many other products essential in the war program. While it appears to be satisfactory for the production of inner tubes for tires, it has not yet proved entirely satisfactory for the manufacture of automobile casings.

Research work now in progress may develop butyl rubber into a product satisfactory for use in automobile casings. For the present, however, its greatest usefulness in the war program is in the manufacture of rubber specialty products and in releasing natural rubber and buna rubber for use in automobile tires.

The contracts for the manufacture of butyl rubber by Humble bring to a close discussions that have continued between Humble and the Government since October 1940 for the manufacture by Humble of rubber and rubber ingredients. In the interim, planning and designing have been in progress; and work on the new plants will go forward without delay. In fact, a substantial part of the materials have been ordered and construction work on the butadiene plant has already begun.

Construction and operation of the new units for the manufacture of rubber and rubber ingredients will not interfere with the manufacture of large quantities of toluene and high-octane aviation gasolines now being carried on by the Humble company.

Waverly Company Increases Capacity of Pittsburgh Plant

PITTSBURGH, Pa. — The Waverly Oil Works Co., Pittsburgh, Pa., recently purchased a crude-distillation unit from the Ultra Penn Refining Co., Bruin, Pa., which had ceased operations. The unit was designed and constructed by Struthers-Wells Co., Warren, Pa., and the Arthur G. McKee Co., Cleveland, Ohio.

The newly acquired equipment consists of a tube still approximately 12 by 15 ft., fitted with 1½ and 2-in. tubes, with a 90-ft. self-supporting steel stack. The tower of this unit is 91 ft. high and 4 ft. in diameter, equipped with 31 trays and the necessary naphtha-stripping column, exchangers, etc.

This unit at the Waverly company's Pittsburgh refinery is expected to be in operation by October 1. The new unit will round out Waverly's distillation operations and is expected to increase the throughput about 15,000 bbl. a month and at the same time decrease refinery per barrel operating cost.

Air Force Establishes Unit To Protect Oil Properties

LOS ANGELES, Calif.—The Army Air Force, material center, western procurement district, has established a petroleum unit for plant protection of oil industry facilities. Offices have been opened in the Subway Terminal Building in Rooms 1021-23-25, Los Angeles, and at 26 O'Farrell Street, San Francisco, Calif.

These offices will be staffed with technically trained men under the direction of Maj. Verne Austin of the Air Corps. Major Austin is well known to California oil men through his former connection with the state Division of Oil and Gas as a petroleum engineer. He is a member of the American Institute of Mining and Metallurgical Engineers and the American Petroleum Institute. He is also a graduate of the Army Industrial College, Washington, D. C., and was working on oil problems in the office of the under secretary of war prior to his transfer to the Army Air Force.

First Fluid-Catalyst Cracking Unit Starts Operating

NEW YORK. — First of the new fluid-catalyst refining units which will boost the nation's supply of 100-octane aviation gasoline is in successful operation, the Standard Oil Co. (New Jersey) announced Monday. In the first 10 days of operation, the new unit exceeded anticipated capacity by 20 per cent. Engineers commented that the first large-scale units of such intricate design and revolutionary principle were usually subject to "children's diseases," but in this case only the mildest forms occurred and have already been remedied.

Success of the initial operation is of importance to the entire industry since more than 30 similar plants throughout the country are being built (about 20 per cent by Standard of New Jersey refineries and the remainder by other oil companies) at a cost of well over $100,000,000. It is these same units, called fluid-catalytic crackers, which the Standard Oil Co. (New Jersey) recently announced might be operated by a newly discovered technique which would enable production of the anticipated volumes of 100-octane aviation gasoline and at the same time turn out a substantial volume of raw materials required for the manufacture of synthetic rubber.

All told, the fluid-catalytic crackers now under construction and due for completion in the middle of 1943 will provide a potential annual production, under the new procedure, of enough additional butylenes for 400,000 tons of buna-S rubber and 240,000 tons of butyl rubber.

The new units are imposing structures approximately as high as a 20-story building and are called fluid-catalytic crackers because the solid catalyst material, finely ground, moves like a fluid through the reaction vessels. The process is a continuous one, and this makes for greatly increased efficiency.

LUFKIN

'MICHIGAN' BABBITT TAPES

Because "Michigan" Babbitt Tapes are so rugged, they're especially popular for field work and for general measuring that calls for rough use. The extra tough steel is coated with a rust-resisting white metal, and markings are deeply stamped into long-wearing Babbitt pads.

WRITE FOR FREE CATALOG

LUFKIN

SAGINAW, MICHIGAN • New York City

TAPES . RULES . PRECISION TOOLS

COLMONOY

Save Time by Using COLMONOY Hard Surfacing Alloys

The head of a welding company recently wrote our engineering department. He had never used COLMONOY—and wanted full information as to the proper grades to use, prices and methods of application.

Part of his letter read as follows:

We have a particular problem presented by the packing sleeve of a hot oil pump in a nearby refinery. The last sleeve was faced with COLMONOY and lasted three to four times as long as the original faced sleeve. We have been asked to bid on a set of sleeves faced with COLMONOY NO. 6.

You can save time, increase production and cut costs by coating all parts subject to excessive corrosion and abrasion with COLMONOY —pump sleeves, wash pipes, plungers, rings and many other parts of oil producing equipment.

COLMONOY will keep new parts on the job longer—and many worn out, discarded parts, when COLMONOY coated, will outwear and outperform new, uncoated parts many times over.

Write Today for Full Information.

WALL-COLMONOY CORP.

Buhl Building, Detroit, Michigan

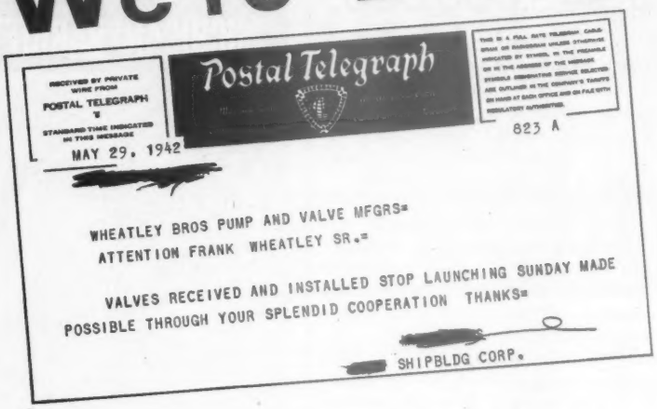
BRANCH OFFICES AT NEW YORK CITY, BLASDELL, N. Y., CHICAGO. TULSA, WHITTIER, CALIF.

OTHER BRANCHES IN CANADA

COLMONOY

Hard Surfacing Alloys and Overlay Metals

We're Doing This



RECEIVED BY PRIVATE WIRE FROM POSTAL TELEGRAPH

STANDARD TIME INDICATED IN THIS MESSAGE

MAY 29, 1942

Postal Telegraph

823 A

WHEATLEY BROS PUMP AND VALVE MFGRS=
ATTENTION FRANK WHEATLEY SR.=

VALVES RECEIVED AND INSTALLED STOP LAUNCHING SUNDAY MADE POSSIBLE THROUGH YOUR SPLENDID COOPERATION THANKS=

[redacted] SHIPBLDG CORP.

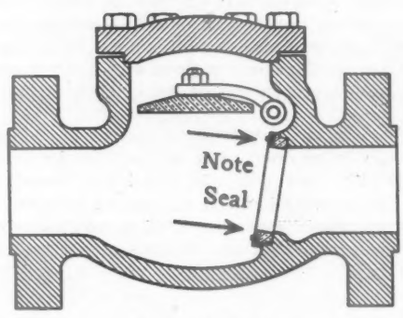
A few days ago we received this telegram which is as gratifying as it is self-explanatory. We're doing our part for the U. S. Navy and we're glad we can help.

We are able to take care of our regular customers without disturbing the flow of vital Navy equipment which is far ahead of schedule.

Don't forget that next to a U. S. Victory Bond, there is nothing better than an investment in a Wheatley Product.

This

A SYNTHETICALLY SEALED WHEATLEY CHECK VALVE IS AVAILABLE ON AN A-8 PRIORITY



Patent applied for

WHEATLEY FULL OPENING HORIZONTAL SWING CHECK VALVE

Semi-steel or Steel body with steel or semi-steel working parts, and sealed with a Synthetic Rubber Ring which is dovetailed into a removable seat. Far superior to the standard metal-to-metal seal.

If this valve does not seal more positively than any other check valve on the market you may return it for full cash refund.

Under severe tests for 18 months. All sizes and series up to 1000 lbs. working pressure in stock.

Write for Bulletin J-521

This

WHEATLEY LIQUID SEAL EQUALIZER

Absorbs Shock on Reciprocating Pumps

Equalizes Pressure on Lines, Valves and Cylinders

Fig. 1.

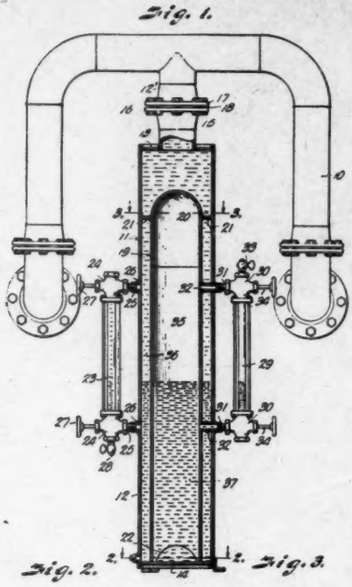


Fig. 2.

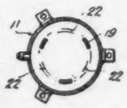
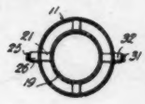


Fig. 3.



(Patent Applied For.)

Now, more than ever, you need the Wheatley Liquid Seal Equalizer that has no moving parts. Nothing Wears—Nothing Tears—Nothing to be replaced. Available for suction and discharge side. Available in a hundred and one sizes and shapes because its principle makes it applicable to any situation.

A new pressure equalizer has been recently developed for use on reciprocating pumps. Such a device is essential on the low pressure or suction side to absorb the momentum resulting from the constantly fluctuating velocity of the fluid. Alleviators are also required on the high pressure or discharge side to equalize shock.

The Wheatley Liquid Seal Equalizer incorporates the best features of the conventional air chamber but eliminates the objectional characteristics. The air or gas cannot escape into the line. This is accomplished by the fact that the sealing liquid is inert to absorption of air or gas from the compression chamber. The liquid is also insoluble in and of higher specific gravity than the liquid being pumped. These features minimize the tendencies toward corrosion and gum forming in the lines and totally eliminate the danger of explosion when air is used in the compression chamber. This new alleviator has no moving parts and therefore no friction.

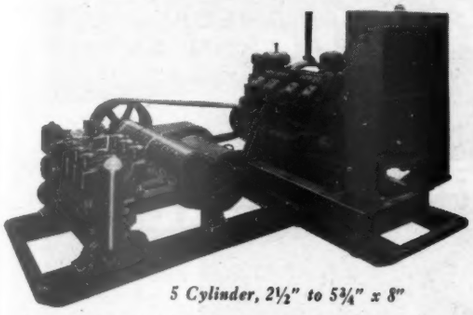
On high pressure applications it may be necessary to charge the alleviator with gas when it is first set in the line. However, periodic recharging is not necessary because the Wheatley Alleviator does not lose its charge. The Wheatley Liquid Seal Equalizer may be used at all prevalent operating pressures of the petroleum pipe line industry.

A thorough trial by a major pipe line has demonstrated the outstanding features and efficiency of the Wheatley Equalizer under actual operating conditions. Location of actual Equalizers now in use will be forwarded upon request.

Write for Bulletin No. J-524.

This

1000 BPH at 400 Lbs.



5 Cylinder, 2½" to 5¾" x 8"

WHEATLEY QUINTUPLEX PUMP

Just off the assembly line is our new and most needed creation; a pump weighing less than 8,500 lbs. capable of developing 1000 bbls. per hour at 400 lbs. pressure, with five individual fluid cylinders and twenty individual valves.

Interchangeable liners in half-inch graduations from 3" to 5¾" with an 8" stroke; ten impulses to one turn of the crankshaft which runs 85 rpm. This feature reduces surge conditions to a minimum. Designed to operate as two distinct units if desired, by placing a valve between the set of 3 cylinders and the set of 2 cylinders. These sets can operate with each having a different size liner making it possible for this unit to develop two different pressures at two different volumes.

Less Weight—More Volume—More Pressure—Fewer Parts—Less Surge

Complete details on application. Write for Bulletin J-525.

GET ACTION WITH FACTS FROM:

WHEATLEY BROS. PUMP & VALVE MFRS.

Home Office and Plant: TULSA, OKLAHOMA

Tom Wheatley Company
Houston, Texas

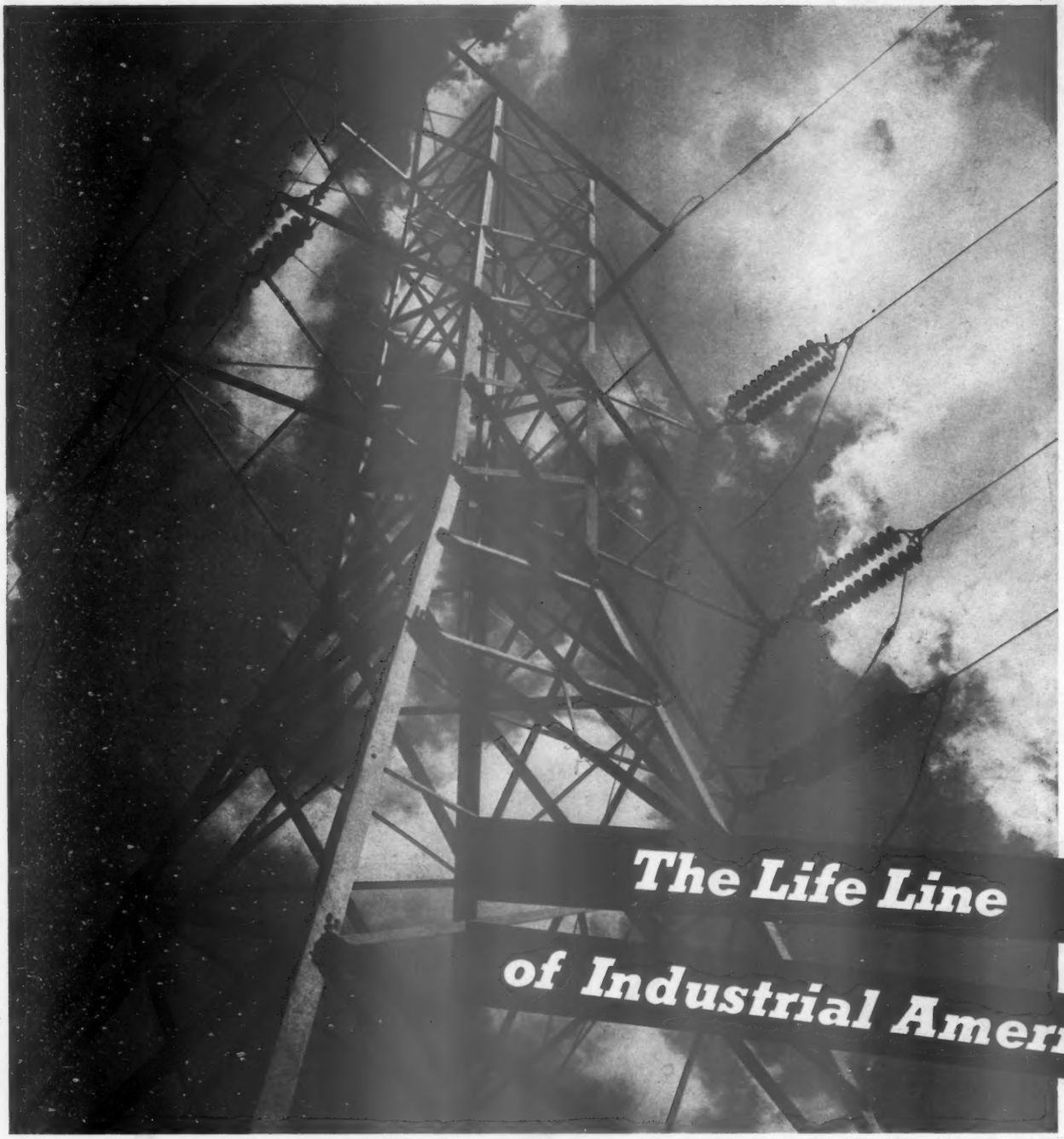
W. P. Nevins
Chicago, Ill.

E. L. Carter
New York, N. Y.

Superior Iron Works
Shreveport, La.

Petroleum Equipment Co.
Los Angeles, Calif.

Davies Sales & Engineering Co.
New Orleans, La.



Electric Power means life for American industry. Our great industrial strength has been built around it. Mass production is possible only through its many advantages. Like the circulatory system of the body, Electric Power flows ceaselessly through a great nation-wide network of arteries, providing vital life-giving power to the drill, the drawworks, the pumping well motor, the centrifugal pump, the refinery and thousands of other important operations. How priceless then is Electric Power that is constantly available, 24 hours a day, every day of the year? And when you stop to think of it, there isn't another service in existence that offers so much, for so little cost, as *Utility Electric Power!*

Use Utility Electric Power!

PETROLEUM ELECTRIC POWER ASSOCIATION

Pipe-Line Activity

Texas-Empire Will Install Pumping Units in Illinois

WASHINGTON, D. C.—Texas-Empire Pipe Line Co. has been issued an L-41 permit from the federal Government authorizing it to proceed with the installation of pumping units at Centralia, Ill., which are required as an essential part of the program for increasing the capacity of the trunk lines northward and eastward. These units consist of two 900-hp. diesel engines connected with centrifugal pumps which have been procured from Texas Pipe Line Co. and which have been moved from a station in Texas. Installation operations will start soon. Work is to be done by the company's organization and a contractor.

During the past month construction work has been progressing on 32 miles of 12-in. loops on the Texas-Empire trunk line north of Heyworth station in Illinois. By filling in blank spaces on a section of line which is already partially looped, the program of the company will provide a double line from Heyworth to Wilmington, Ill.

Arkansas Louisiana Gas Co. Project is Half Completed

Within 60 days it is expected that the natural-gas line will be completed which Arkansas Louisiana Gas Co. is laying between Magnolia, Lake Catherine and Bauxite, Ark. All of the 33 miles of 12-in. called for by the contract has been laid. In addition, 30 miles of 18-in. has been laid.

The remainder of the project consists of 30 miles of 18-in. required for finishing a total of 123 miles of line. Construction is being handled by Midwestern Engineering & Construction Co. This contracting firm has completed two lines laid for a river crossing for Natural Gas Pipeline Co. of America near Rockford, Ill. It has also contraeted the relaying of 6 miles of 6-in. for Texas Empire Pipe Line Co. near Lockport, Ill.

Proposals for Canadian Lines Are Discussed

In addition to the proposed pipe line from Norman Wells, in the Mackenzie district of Northwest Territories, to White Horse, Yukon, other lines are being discussed for western Canada.

The Canadian Government has announced that it is considering the construction of a line from the tar sands of the McMurray area on the Athabaska River to the Edmonton area, Alberta. The possibilities for these pipe lines as well as another one which might provide an outlet to the Pacific Coast of Canada are discussed in an article by Dr. W. V. Howard which appears elsewhere in this issue.

Manufacturers Gas Light Lays Pipe Line in Pennsylvania

Construction of 30 miles of 16-in. natural-gas line for Manufacturers Gas Light Co., subsidiary of Columbia Gas & Electric Co., is now under way in western Pennsylvania. The contractor's work is being supervised by T. E. Davis, superintendent of Williams Brothers Corp., which has established temporary field headquarters at Washington, Pa.

Williams Brothers Corp. is laying lines connecting storage tanks with docks at a marine terminal used for shipping petroleum products at Dartmouth, N. S. The contractor's work is being supervised by H. E. Murphy. The 10 miles of pipe being laid for the project includes 6-in., 8-in. and 12-in., but most of it is 16-in.

This construction organization has completed the laying of 132 miles of 18-in. for the U. S. Navy at Key West, Fla. This important project was built under unusual conditions across coral keys. Three tractors were used for carrying shooting mats for each of the shooting gangs which worked in three shifts. In this undertaking approximately 2,000 men worked in 15 gangs.

Portland-Montreal Shipments Continue at Reduced Rate

Shipments of crude through the 235-mile 12-in. pipe line constructed last summer between Portland, Me., and Montreal, Que., have been moving at a considerably reduced rate since the first of the year. Shipments in May through the line consisted of cargoes of four tankers, it is reported.

Florida Line Regarded As a Possibility

Although Congress refused to authorize the construction of a pipe line across Florida early last week, it is reported that consideration continues to be given the project by government officials. Before Congress acted on the proposal President Roosevelt said that if Congress declined to appropriate for its construction there would be a possibility that funds would be available for it which do not require congressional appropriation.

J. R. Parten, director of Transportation Division, OPC, said the coordinator's office favored construction of an 8-in. or 10-in. pipe line across Florida which would move from 40,000 to 60,000 bbl. per day.

He expressed the opinion that limitations surrounding the use of inland barges would make it unfeasible to build a 24-in. line across Florida with a 250,000-bbl. capacity, as has been proposed.

It was believed that the smaller volume could be distributed by available steel barges along the eastern coasts of Florida, Georgia and South Carolina.

Engineers had estimated, he said, that the line could be built in from 4 to 6 months, at a cost of from $3,000,000 to $3,250,000, and would be able to supply southeastern states now using the Plantation line from Baton Rouge, La., to Greensboro, N. C., making the capacity of the latter available for other rationed sections.

United Requests Permit From FPC to Remove Pipe

The Federal Power Commission announced its order setting for hearing early this week an application filed by the United Gas Pipe Line Co. for permission to remove and relocate certain natural-gas pipe-line facilities in the Rodessa area of Northwest Louisiana. The hearing will be held in the commission's hearing room in Washington, D. C.

The application states that a portion of the company's gas supply is obtained from the Rodessa field in Caddo Parish, Louisiana, and that three looped lines extend 20.31 miles from the field to the company's main Sarepta-Latex transmission line. According to the application, more than one-third capacity of these Rodessa loop lines is no longer needed, and one of the three loops constitutes the facilities which the company would take up and relocate.

CLASSIFICATION OF CRUDE OILS

THE CLASSIFICATION OF CRUDE OILS THROUGH LABORATORY ANALYSES NOW REQUIRED BY THE STATE AND FEDERAL REGULATORY BODIES IS FOR THE PURPOSE OF PRORATION AND PRIORITIES WHEN ORDERING DRILLING EQUIPMENT.

AUTHENTIC AND IMPARTIAL SAYBOLT ANALYSES OF CRUDE OILS, NATURAL GAS AND NATURAL GASOLINE ARE BEING USED AS A BASIS FOR THIS CLASSIFICATION.

SAYBOLT

MEMBERS API—ASTM—SAE

LABORATORIES LOCATED AT:
NEW YORK, N. Y. HOUSTON, TEX.
PHILADELPHIA, PA. CORPUS CHRISTI, TEX.
NEW ORLEANS, LA. WILMINGTON, CALIF.

LABORATORY AND SAMPLING SERVICE AVAILABLE DAY AND NIGHT

E. W. SAYBOLT & CO.
Inspectors of Petroleum
PETROLEUM BUILDING
HOUSTON, TEXAS

UNIBOLT
THE ONE BOLT COUPLING

ELBOW ROOM FOR STEAM LINES

UNIBOLT "Flexi-Ball" joints permit high-temperature lines to expand and contract without placing strain on connections.

THORNHILL-CRAVER COMPANY
HOUSTON

Avoid WEED Fires
AROUND
STORAGE TANKS
WITH
ATLAS "A" WEED KILLER
SODIUM ARSENITE
NON-INFLAMMABLE
NON-EXPLOSIVE
Write For Information and Prices
CHIPMAN CHEMICAL COMPANY
Bound Brook, New Jersey

is as dangerous as any "fifth columnist"

The oil going up in smoke from this burning pit will never be converted into vitally needed aviation gasoline—aviation lubricants—synthetics—gasoline and lubricating oils. Such waste is a definite economic loss that increases the producing cost of pipe line oil. Dehydro, the Petroleum Treating Compound, will reduce this waste to the minimum.

"Dehydro Engineers" are constantly on duty, working to save these vital materials for use in our war program and to eliminate this economic waste. Their services and recommendations on Oil Treating are yours, without obligation. Write—

"Dehydro Engineers", in green cars are located in—Great Bend and Hutchinson, Kansas—Wewoka, Ada, Duncan, Oklahoma City and Wilson, Oklahoma—Kilgore and Wichita Falls, Texas—Tullos and Monroe, Louisiana—Hobbs, New Mexico—Bridgeport, Mt. Vernon and Albion, Illinois—Tulsa, Oklahoma.

Use *PARASOL on your PARAFFIN Problems

*Reg. U. S. Pat. Office

THE DEHYDRO COMPANY ... Tulsa, Okla.

FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

One of the commonest complaints against geologists is the fact that they are prone to issue blanket condemnations of areas which later prove to be highly productive. Sometimes these complaints are not wholly justified by the facts. It has often been stated that geologists condemned East Texas. The condemnation, when it was expressed at all, consisted of an appraisal of the reward in terms of the risk of more or less blind drilling on the flanks of the Sabine uplift.

There is more point to the criticism of geologists who considered the Permian basin and the Panhandle of Texas nonproductive. Some of this apparent timidity on the part of geologists is due to theories imparted in the classroom, generally by professors whose knowledge of oil was restricted to what they read in text books. Some of it is a reaction against impossible hypotheses advanced by others.

An interesting example is in the news this week as the result of two possible discoveries of oil in the Cambrian Hickory sand of West Texas. Based on studies of the Appalachian region and Ohio, the theory has gradually been implanted in the minds of many men that the Trenton limestone is the lowest possible pay. The Trenton is Middle Ordovician in age and parts of it may be correlated with the Viola lime. Everyone knows that there is much production from below the Viola so that there is an unconscious shift from "Trenton" to "Arbuckle" or "Ellenburger" as the lower limit of production.

Despite the fact that Cambrian sands produce in Kansas, there is still considerable hesitation in drilling through the Lower Ordovician limestone series in search of similar production. In much of the Mid-Continent, these limestones are so thick that the risk outweighs the expected reward, which is generally placed at a minimum because of the inhibiting belief that there is no oil in the Cambrian.

Oil in igneous rocks is also considered a poor risk, mainly because of a reaction against the hypothesis, that oil is of inorganic origin and migrated upward through the granite. The facts, as now known, justify this reaction but geologists are sometimes blinded to the fact that oil found at the top of a rock formation need not have migrated upward through the rocks. For all we know it may never have migrated at all. All rock which has been exposed to weathering may be made porous. If a porous rock is submerged below sea level, source material which eventually becomes oil may be deposited in it. It does not matter whether the porous rock is limestone, granite, or serpentine. The important factors are porosity and submergence.

Similarly, the age of the porous rock is not of any significance. A pre-Cambrian granite submerged beneath a Permian sea may contain as much oil in its weathered surface as if it were Pennsylvanian in age. The important fact is that there was organic material in the sea. From actual drilling in Kansas it has been determined that the Cambrian sediments can contain oil in commercial quantities. In Pecos County, Texas, two tests reported this week confirm the presence of oil in the Cambrian. Whether they prove of commercial importance depends entirely on local conditions rather than on the age of the sediments forming the prospective reservoir.

The lower limits of oil production should be revised downward to include the Cambrian and no virgin territory can be condemned if it has any marine sediments in it above the zone in which metamorphism precludes the present existence of oil at greater depths.

Completions reported last week were five above those of the week before. Oil wells were down nine, while gas wells and dry holes were up eight and six.

SOUTHWEST TEXAS: Wilcox production is in prospect from a wildcat in De Witt County on the same strike as Thomaston and Yorktown. In Wilson County, the Boysen test shows promise of production after water believed to be coming from an upper horizon is shut off (p. 78).

LOUISIANA GULF COAST: The Sparta is reported to be showing oil on the southwest flank of Pine Prairie at a level deeper than other pays on the east flank. After finding 11 prospective pays between 9,500 and 10,250 ft. the Jug Lake and Casteel tests in Terrebonne Parish are drilling ahead (p. 76).

TEXAS GULF COAST: A deep test near the heart of the Livingston, Polk County, field recovered oil from the Wilcox on a drill-stem test. The field is now producing from the Cockfield. This is the fifth Cockfield pool to find deeper production in the Wilcox. Wilcox oil has been recovered from a 1-mile north outpost of the Mercy pool and shallow production was found on test in the Cistern area, Fayette County (p. 77).

NORTH TEXAS: Marble Falls production has been found 7 miles south of Jacksboro and 3 miles southwest of a recent Strawn sand discovery (p. 80).

CALIFORNIA: Antelope Plains appears likely to join the long list of disappointing discoveries as the second well missed the pay sand. The third Turnbull Canyon well found the sand unproductive and is going ahead (p. 68).

EAST TEXAS: First Paluxy oil production south of the fault-line fields at Talco and Sulphur Bluff was reported near Winnsboro in Wood County (p. 83).

WEST TEXAS: In addition to the possible Cambrian pays in Pecos County, other possible discoveries included a Delaware sand pool northeast of Monroe in Ward County and in Lubbock County southeast of Nairn (p. 70).

ILLINOIS: A wildcat between Boyleston and the main McClosky trend of Dundas and Clay City is reported flowing from the McClosky. A Biehl sand pool has been opened south of Albion in Edwards County. Four pool openers were completed in scattered localities (p. 66).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended June 6, 1942)

	Oil	Gas	Dry	Total	Footage	Ttl. comp. to date 1942	Ttl. comp. to date 1941
N. Y., Pa., and W. Va.	46	12	7	65	119,621	1,617	2,270
Ohio	5	14	4	23	59,195	422	654
Indiana	2	2	4	8	11,904	160	202
Kentucky	0	4	0	4	10,432	158	271
Illinois	18	1	17	36	94,007	712	1,388
Michigan	6	2	11	19	42,060	302	367
Kansas	19	1	16	36	118,267	657	801
Nebraska	1	0	0	1	2,468	19	39
Missouri, Iowa	0	0	0	0	0	9	9
Oklahoma	6	1	8	15	46,410	581	636
Texas:							
North Central Texas	13	1	9	23	62,217	578	1,144
West Texas	9	0	3	12	50,368	745	872
Texas Panhandle	3	1	0	4	12,744	206	229
East Texas	3	0	1	4	17,607	190	501
Texas Gulf Coast	7	0	2	9	57,867	384	463
Southwest Texas	9	0	12	21	99,488	606	765
Total Texas	44	2	27	73	300,291	2,709	3,974
North Louisiana	4	0	0	4	21,880	222	252
Louisiana Gulf Coast	7	0	7	14	146,910	259	370
Total Louisiana	11	0	7	18	168,790	481	622
Arkansas	0	0	0	0	0	64	67
Mississippi and Southeast	0	0	0	0	0	40	105
Montana	4	1	0	5	11,215	70	101
Wyoming	1	0	1	2	5,835	42	61
Colorado, Utah	0	0	0	0	0	4	17
New Mexico	4	0	0	4	14,502	136	222
California	6	1	0	7	25,624	345	440
Total United States	173	41	102	316	1,030,621	8,528	12,246
Total previous week	182	33	96	311			
Week ended June 7, 1941	429	45	120	594			

Resistivity Method of Locating Oil and Gas Pays

By J. L. HARPER

Electrical prospecting for ore deposits has resulted in the development of many large mines but the method has not been widely used in exploration for oil. In this article, J. L. Harper of Jackson, Miss., outlines the principles which he has followed in the use of resistivity methods and presents some of the results obtained by him.

MUCH has been written and many discoveries have been attributed to geophysical methods of exploration, such as seismic, gravity meter, magnetometer and soil analysis. In the writer's opinion some points should be cleared up and some facts should be added to the knowledge of another method, namely electrical resistivity.

A great deal of research, months of experimenting, and nearly 4 years of field application, acquired under varying conditions, are the basis of experience from which I am going to draw.

The field work has been done in and near oil fields in southern and northern Ohio, southern and central Kentucky, northern Montana, Mississippi, southern and western Saskatchewan, southern and eastern Alberta, Canada, and other areas.

Thus the rocks examined have ranged in age from Tertiary, Cretaceous, Jurassic, Triassic, Pennsylvanian, Mississippian, Devonian, Silurian and Ordovician to the Cambrian. This range covers nearly all the geological formations in which oil and gas has been found, both in the United States and Canada.

Equipment Used

The apparatus to be used depends upon choice and the depths to be penetrated. Several scientific-instrument dealers offer very useful outfits. The instruments can also be found in any good school of physics. One of the very good sets consists of a potentiometer equipped with a very sensitive galvanometer hand scaled from 0.001 mv. and with rheostat to enable large anomalies to be read; a very sensitive milliameter scaled from 0-5 to 0-500 ma., and a switch gear box.

The current to be used can be either direct current obtained from radio batteries of several hundred volts, or an alternating-current generating set. The best results seem to be obtained from the use of direct current, which does not encounter the variation of frequencies. Also the batteries can readily be obtained, and in very rough country their portability is a very good feature.

Add to the foregoing an arrangement for reversing the current, chemical electrodes if direct current is used; field telephones for each of the four to six traverse men, and the trouble shooter; a switch board for the telephones; plane table; transit; compasses, aneroids and such other equipment usually carried by a geologist.

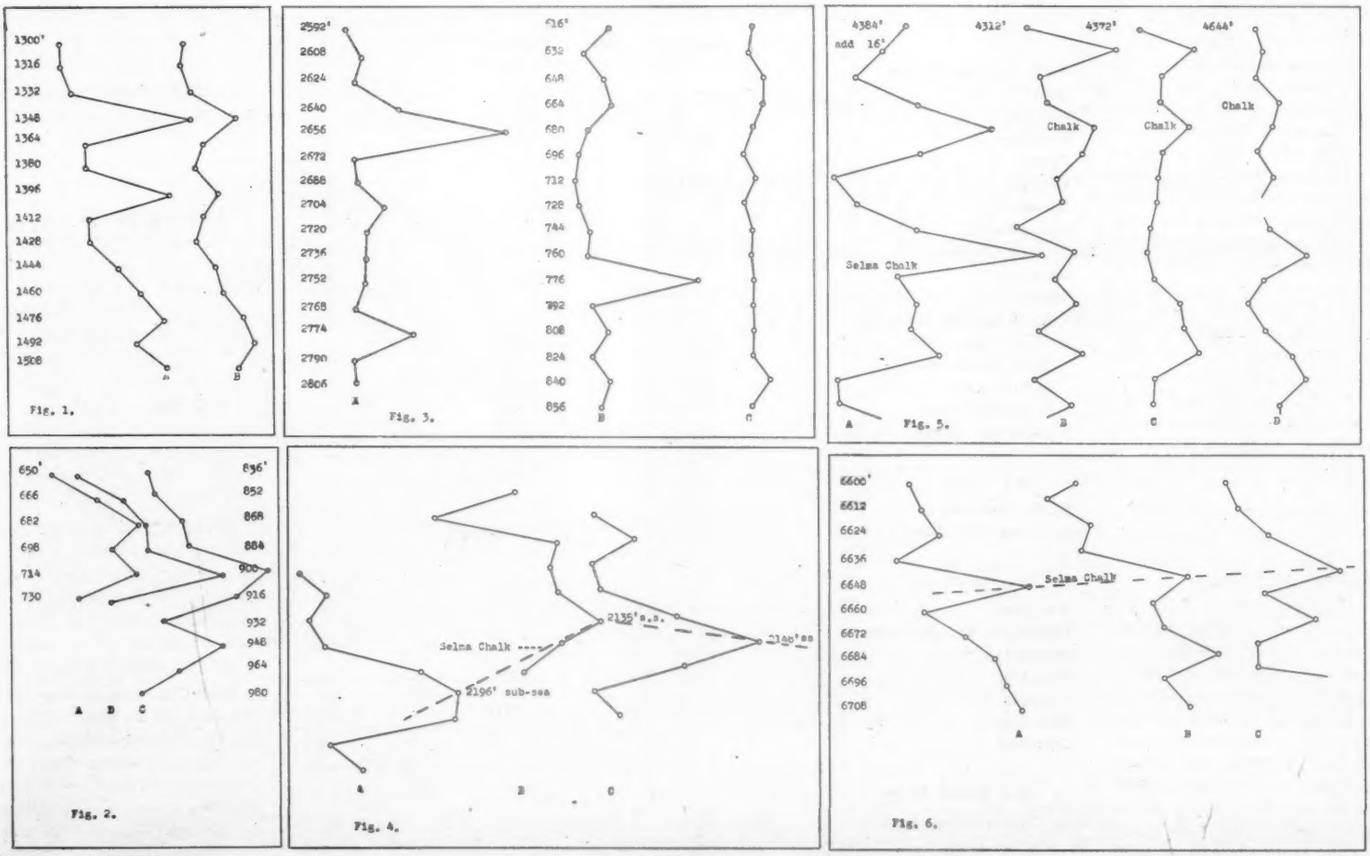
The wire is small, covered with a very tough rubber insulation, and light weight for portability. It is carried on reels, somewhat like the reels used in seismic work. For identification purposes and as a check, the 1,000-ft. reels are painted black, the 500-ft. reels and the wire are painted green, the 300-ft. yellow, and the 200-ft. red.

Field Procedure

All the equipment is carried in a panel truck or station wagon, that being the vehicle in which the instruments are set up for work. It should contain a portable work table, and cable connections for the current wires, the ground connections, and the field telephones.

Arriving upon the location selected, the measured traverses are laid out in their proper direction, the current and electrode wires are rapidly run out from the carrying reels. Four to six men are ordinarily used, also a trouble shooter who acts as assistant for phone communication.

The depth to be penetrated is a matter of cor-



Resistivity profiles (for description see text)

rect measurement on the surface. Using one of the spacing methods it has been found that depth is approximately one-third of the current stake separation. Other methods vary according to the configuration used. Two or more current stakes usually occupy the end positions with high and low potential electrode pickups at measured intervals on the sides of station location. The current stake men and the electrode pickup men are in constant telephone communication with the station operator, and after a reading is taken they are instructed to move to the next numbered set. In this manner the depth penetrations are regulated. Depth penetrations are usually 8 to 16 ft. deeper with each move; however, they can be any depth desired.

Current is caused to flow into the ground from the batteries and is measured by the milliameter. The laws governing its penetration, depth, ohmic effect and lines of equipotential occupied, while confusing to some, are laws that are fairly well known and somewhat commonly understood.

Current leaving the ground is picked up by the electrodes and measured in millivolts by the poteniometer. The distance between the current stakes and the electrodes being known, if the ground configuration is a simple one Ohm's law can now be used. However, the surface resistance, time, and the geological layers may enter into the problem. From these data the resistivity is computed, and may be plotted as a function of depth and so depicted by graph.

At this point occurs the choice of the acceptance of figures as the true index of resistivity or the change of the whole or part of the electrical makeup of the rocks. Upon this point a great deal of the accuracy of interpretation depends. The geological knowledge necessary to interpret properly plus the knowledge of the electrical makeup or characteristic is a matter of field experience.

The resistance of rocks and formations to an electrical current varies a great deal. Part of this resistance is due to the kind of rock, whether limestone, sandstone, clay, shale, etc., and part of the resistance depends upon the water content, and grain and pore space of the rock itself. It may be said that to a great extent formations are somewhat recognizable over large areas, and many times they have some distinct electrical characteristic.

It is when some other substance such as oil, gas or salt water enters the rocks that these characteristics change and the task of interpretation becomes a difficult one.

Electrical makeup of rocks may change in a short distance. So may the lithology, so in places does the paleontology.

The contact of two formations, especially if one is different, and such distinct geological changes as the contact of the Madison limestone in northern Montana, and Canada, the Tallahatta-Wilcox contact in Mississippi, the Midway-Selma chalk contact in Mississippi, and Ohio black shale-Big lime contact of Ohio and Kentucky, can in most instances be quite readily detected.

Discussion of Profiles

Ohio

Fig. 1.—This is a section surveyed electrically from the surface over one of the Trenton oil pools of northern Ohio. *A* is the graph of the producing oil sand and *B* was later reported dry. Instrument was set up so as to examine the producing oil sand, although depth to the oil was not known. The clearness of this graph speaks for itself. Survey was then carried out into unknown territory, where later drilling proved the prediction, dry. This oil-bearing formation is a dolomite. Experience obtained here enabled correct interpretation to be made later in another state. The Trenton rocks of southern Ohio differ from those in the northern Ohio oil pools. There is a further difference in Kentucky. The southern limit of the dolomite is not known at this time.

Kentucky

Fig. 2.—One of the Kentucky oil pools. *A* is a dry hole. *B* is a producing oil well. From these data a location, *C*, was selected. It was later drilled and was a small oil well. Other work in Kentucky produced satisfactory results. Formations examined ranged in age from Berea and Corniferous to the St. Peter.

Montana

Fig. 3.—*A* is a producing oil well in northern Montana in the Sunburst sand above the Madison limestone. *B* is a producing gas well in the Bowdoin zone. *C* is a dry hole a short distance away. The gas well is in a sand in the Colorado shale. From these data a wildcat well was located many miles away. It was drilled and produced gas, and will no doubt be made into a small producer. Away from the uplifted areas the dip in Montana is fairly regular, and this enables very satisfactory field work to be done. There should be undrilled areas of considerable promise.

Mississippi

Fig. 4.—This is the picture of two large gas wells and a dry hole in a Mississippi gas pool. All locations were made by resistivity before drilling. Producing zone is the top of the Selma chalk. The wells are several thousand feet apart. *B* and *C* are the producers and *A* is a dry hole due to error in depth. It was predicted to be a producer, and the error was detected too late.

Fig. 5.—These profiles are from oil wells in the Tinsley pool. The producing zone shown is the Woodruff sand, where the pay was found at some 80 to 100 ft. below the Selma chalk. *A* is a typical oil well south of the fault. *B* is an oil well nearer the fault. *D* is an oil well north of the fault. *C* is a dry hole in the Woodruff. It was predicted dry, and so recorded before drilling. This work was done in the early days of the pool, in March 1940.

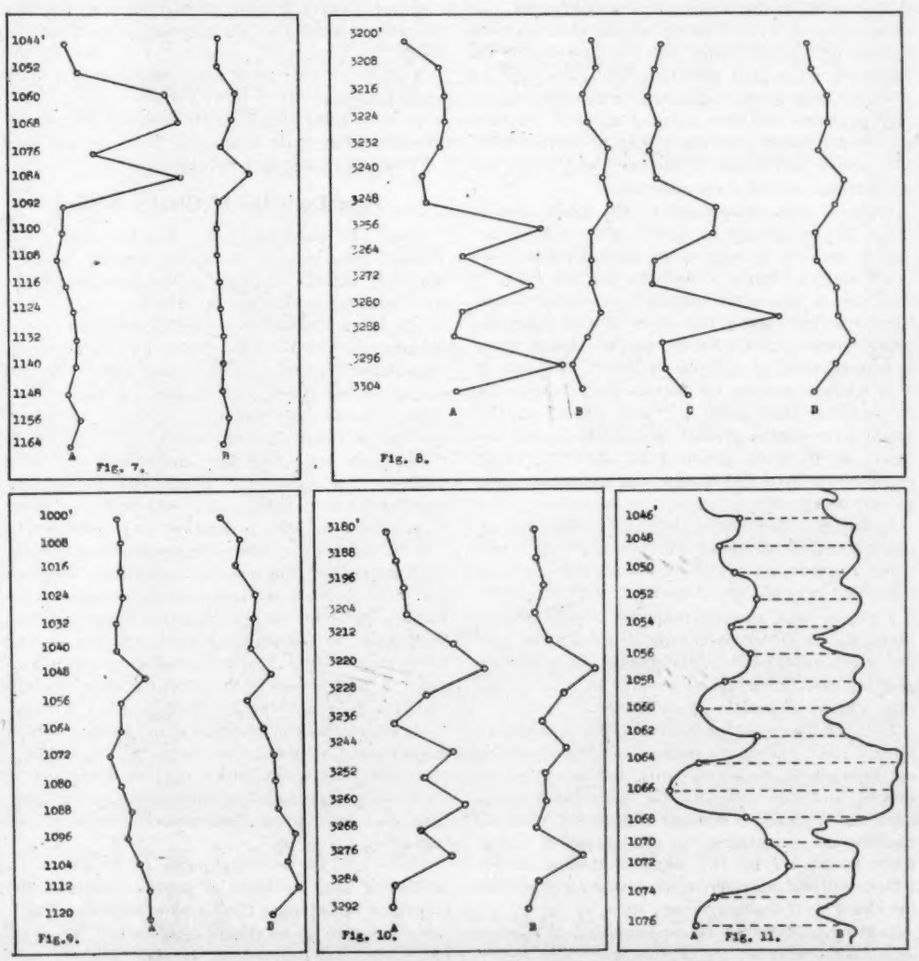
Fig. 6.—One of the undrilled structures in Mississippi graphs this profile These are all from the Selma chalk and are going updip. They are so alike the *A* of Fig. 5 and the *B* and *C* of Fig. 4, although many miles apart, as to suggest that structures could be contoured on the chalk by resistivity. This has been done.

Fig. 7.—Just north of Jackson, Miss., gas blew in at the top of the Wilcox formation. It produced about 200 million cubic feet of gas before being abandoned. The well has since cratered and still blows a considerable amount of gas. The picture obtained from the crater is *A*, and *B* is the offset and was dry in the Wilcox.

Canada

Fig. 8.—From the data obtained from several seasons of field work it would appear that the Madison limestone can be recognized, and used as a key horizon. The high in *A* and *C* at 3,288 ft. to 3,296 ft. is the Madison and would be easy to interpret. But *B* and *D* would not be so easy. However, a method has been found to greatly aid in the interpretation of this formation. A producing oil well and a dry hole are depicted on two of these profiles.

The formations are somewhat different in their



Resistivity profiles (for description see text)

characteristics in different parts of Canada. The Madison becomes increasingly difficult to interpret in places. Contacts of some of the geological tops above the Madison can be correctly platted, and there seems to be a more uniform electrolytic content of some of the upper beds.

Operating Conditions

Fig. 9. shows the same traverse, *A* the results of resistivity when the ground was dry, and *B* the same traverse when the ground was wet. The difference in resistivity is very slight.

The same is true after the freezeup in the north country.

However, ice in the chemical electrodes gives trouble.

Fig. 10. — When deep examinations are made, one of the physical disadvantages is the long lines of wire needed. In some of the schemes of laying out traverses, this amounts in feet to approximately three times the depth to be penetrated. Thus if penetrating to a depth of say 8,000 ft. that would mean about 24,000 ft. of wire from one end to the other. Another scheme does not use so much wire, only about one-half. *A* is the curve using over twice as much wire as *B*, and yet such formations as the Sunburst at 3,220 ft. appear quite distinctly in *B*.

Comparison With Electric Logging

Fig. 11.—Before a well was drilled that part of the formation to be tested was examined from the surface with resistivity in close detail, using increasing depth penetrations of 2 ft., the same as the electric log. By using a smooth curve this surface survey plotted in *A* exhibits a striking similarity with that of the electric log in *B*. The electric log was made by one of the service companies, of course after the well was drilled.

Under average field conditions 150 ft. to 250 ft. in depth penetrations can be done in an hour, after the station is set up. From three to five stations can be occupied in a day.

Depths to over 7,800 ft. have been examined by the writer. That is not the limit by any means, and one of the geophysical trade journals reported depths in West Texas of over 15,000 ft. had been penetrated in the search for oil.

Oil and gas can be located from the surface before drilling. And the depth can be calculated quite accurately.

Whether this can be done under all geological conditions is not known at this time.

Amendment to Spacing Order Affects Few Illinois Fields

By HERNDON E. DAVID

ILLINOIS operators, hopeful that immediate action will be taken on a series of requests for exceptions to OPC drilling regulations and enthused by an announcement of Petroleum Coordinator Ickes that qualified applicants will be accorded relaxations of current restrictions in spacing requirements, have stepped up their exploratory and development campaigns to such a point that active operations in the state are on an upward trend toward a normal status.

Under a plan announced by Mr. Ickes applications for exceptions to Order M-68 will be accepted for the present time from Illinois operators and favorably considered on the basis of well depth, where the physical producing conditions warrant, along the lines of the following approximate rules: 5-acre surface spacing for sand reservoirs at a depth of 500 ft. or less; 10-acre surface spacing for depths greater than 500 ft. and less than 1,500 ft.; and 20-acre surface spacing for depths greater than 1,500 ft. and less than 2,500 ft. Wells greater than 2,500 ft. in depth must conform to the 40-acre spacing requirement of the order.

It was also announced that applications for exception requesting closer well spacing than is provided by the order will be considered with the following general conditions in mind:

1. Closer well spacing than the 40-acre general limitation of Order M-68 will be considered only for the development of sandstone oil reservoirs and not for limestone reservoirs in Illinois, except under unusual circumstances.

2. The number of producing horizons existent in any field, the characteristics and productivity of the various separate sands, the available reserves, and the necessity for separate development as opposed to the possibilities of multiple completions, permitting the production of one or more reservoirs by the same well, are factors which will be considered in analyzing the need for closer well spacing in any field.

3. Where conditions require closer well spacing than now permitted under the order, the extent of the closer drilling that will be approved will be guided by the depth of the particular sand reservoir, in recognition of the fact that less material is expended in the development of shallow pools.

A study of this plan with regard to the presently known fields in Illinois indicates that it will have very little effect on these fields and, therefore, its merit must be derived from its influence on future drilling and development.

Plan Excludes McClosky Wells

Under the announced plan the McClosky lime, Illinois' most prolific producing horizon, is automatically eliminated as far as the less-than-40-acre well spacing is concerned. Since the beginning of the Illinois basin play, the discovery and rapid development of McClosky pools has been largely responsible for maintaining the high daily oil output of the state. The 40-acre spacing requirement, however, eliminates one-half to three-fourths of the wells that are usually drilled in these pools once they are discovered and it is unlikely that pools can be discovered and developed fast enough under existing conditions to maintain the daily production at present levels.

With the state's outstanding producing horizon eliminated from the possible exceptions, the plan leaves the burden of increasing or even maintaining the present output largely on the existing sand pools in the state. A study of the existing pools reveals that 72 have producing sand horizons at depths less than 2,500 ft. (See The Oil and Gas Journal, May 14, 1942, p. 100.) If those fields such as Salem, Woodlawn and Benton, which are already completely developed, are eliminated, less than 15 are left which may be benefited at all by the proposed exceptions, and there is very little area for future development left in any of these.

There are no existing pools in Illinois with producing sand horizons at depths less than 500 ft. except those along the La Salle anticline which were completely developed long before the present basin play started. It is also unlikely that any such reservoirs will be found in the future. Therefore, the clause permitting 5-acre spacing for sand wells less than 500 ft. in depth is meaningless when applied to Illinois.

Five Undeveloped Shallow Pools

Although there are many pools in the state with sand horizons between 500 ft. and 1,500 ft. in depth, only five can be considered as eligible for future development. Of these, the West Centralia and South Maunie pools will not be affected by the exception plan since their productive areas have been drilled to such an extent that 10-acre spacing would mean only one or two additional wells at the most. Two others, the Posey pool of Clinton County and the Tamaroa pool of Perry County, both Cypress sand producers, have not received extensive development to the present time. Only small wells have been completed in either pool, however, and 10-acre spacing instead of 40-acre spacing would mean the addition of a very few wells, if any, in any development planned for the future of the pools. The remaining pool, the Boulder pool of Clinton County with Benoist production at 1,200 ft., stands to benefit more from the spacing exceptions than any existing pool in Illinois. This pool is a recent discovery and has only two producers at present, both of which were drilled on 40-acre locations. If 10-acre spacing were permitted in this pool, it could result in, according to present indications, the addition of up to 30 producing wells that could not be drilled otherwise. Wells completed in the Boulder pool produce from 200-300 bbl. a day initially. The addition of 30 wells of this productive capacity would increase the state's daily output considerably.

There are approximately 14 pools in Illinois with any acreage left for future development that have productive sand horizons between depths of 1,500 and 2,500 ft. Of these, only six or seven pools stand to benefit from well spacing of less than 40 acres. If the physical condition of these fields warrants, 20-acre spacing is possible. Such a spacing program in the fields which can qualify would probably mean less than 50 additional producers for the state. These wells, considering the fields in which they would be drilled, would average about 50 bbl. per well per day initially. After a few weeks the production of these wells would probably decline, as is a characteristic of all Illinois wells, to a point where they would not affect production figures to any extent.

In most of the fields along the Wabash River in Illinois production is obtained from several horizons in the same field. In all of these fields some of the sands are above 2,500 ft. while some of them are below 2,500 ft. If locations of less than 40 acres were allowed for wells less than 2,500 ft. in depth and 40-acre spacing were required for wells more than 2,500 ft. in depth the proposed exception plan would seem to defeat its own purpose, since the sands below 2,500 ft. are usually the more prolific producers. That is, if two wells were located on a 40-acre tract, one producing from sands above 2,500 ft. and one a multizone completion in all sands below and above 2,500 ft., the well producing from the sands above 2,500 ft. would seem to be a waste of casing since by drilling only a hundred or so feet deeper the well could be made to produce three or even four times what it would produce if completed at a depth of less than 2,500 ft. What spacing programs will be required for multizone fields, however, has not been clarified and remains to be seen. It may be concluded, therefore, that the exception plan will not be of much benefit to pools discovered prior to its announcement. At the most it would mean the addition of less than 100 wells in these fields and probably less than 7,000 bbl. of oil daily added to the state's output.

Thus the entire merit of the plan lies in its

(Continued on Page 85)

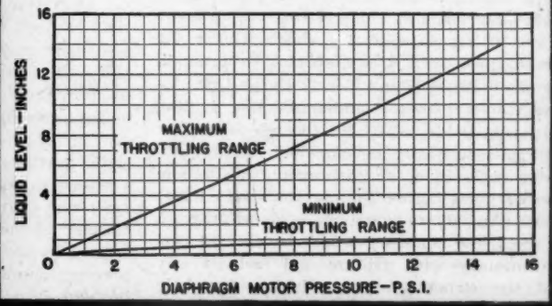
FISHER ANNOUNCES an Improved DISPLACEMENT TYPE LEVEL-TROL

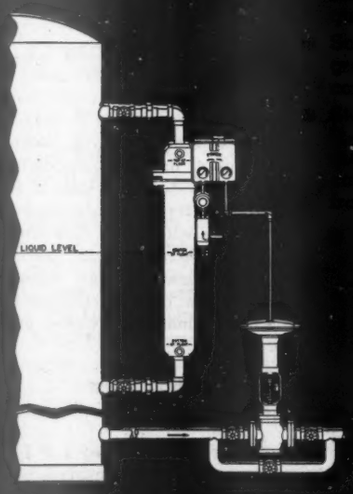
Pilot Relay Speeds Action of Diaphragm Valve in Response to Level Change. Intermittent bleed relay, greatly magnifies pressure and volume of air passing through primary orifice system. Response of diaphragm valve to level change is extremely rapid.

Level Position Adjustment Permits Operator to Control Level at Any Desired Point within Length of Float. Adjustment is easily made by turning the knob in accordance with the arrow on adjustment dial.

Throttling Range Adjustment Makes Level-Trol Suitable for Wide Variety of Applications. Makes it possible to vary amount of level change necessary to fully stroke diaphragm valve. Minimum level change may be as little as ½" and the maximum equal to length of float. Adjustment knob provided with calibrated dial — easily operated — readily accessible.

Straight Line Action . . Curves, below, illustrate how pressure changes on diaphragm as level changes throttling range setting in the two extreme positions.





• FISHER GOVERNOR COMPANY •

• 240 FISHER BUILDING •

MARSHALLTOWN, IOWA

Second Antelope Plains Well Misses Williams Sand

By L. P. STOCKMAN

LOS ANGELES, Calif.—Shell Oil Co., Inc., in its second well in the Antelope Plains field of Kern County failed to find the Williams oil sand of Miocene age and will finish this well as a gas producer. Shell's second well is 67-6 Williams which was carried down into the Eocene at 3,419 ft. but subsequently plugged back to 2,190 ft. On a formation test at 1,847-2,190 ft. and open 11 hours and 46 minutes the well flowed gas at a daily rate of 400,000 cu. ft. Since wells usually flow at a larger rate on formation tests than under actual producing conditions this well should be good for about 300,000 cu. ft. per day if the same size bean is used. A string of 5½-in. casing has been cemented at 2,188 ft. and carries perforations at 1,846-2,005 ft. and 2,041-2,188 ft. This well is located southeast of the discovery well and tends to indicate the apex of the structure is west and northwest of the first well. The gas sand in which 67-6 Williams will be completed is located higher structurally than the Williams oil sand and was found first in the discovery well. Chanslor-Canfield Midway Oil Co. which started an offset to 67-6 Williams has suspended operations following failure to find the Williams oil sand or sufficient natural gas in the upper gas zone. Chanslor-Canfield Midway's well was No. 7-1 on fee owned acreage about 2,500 ft. south of Shell's discovery well. Total depth at last reports was 2,840 ft. and the company may make a little more hole before actually abandoning the hole.

The Antelope Plains field produces a low gravity oil that is in high demand to meet the increasing requirements for fuel oil. Completion depth is quite shallow which means low development and lifting costs. Shell's second well in the field was based on a 40-acre spacing program in conformity with M-68 and clearly shows that this spacing results in costly and ineffective drilling in California fields. Shell is expected to request the OPC to authorize development on a more intensive scale in order to prevent the drilling of several holes before finding the outer limits of production. By reducing the spacing program to 10 acres, the company would be able to proceed cautiously with drilling and feel its way around the structure thus reducing dry hole losses to a minimum. Barnsdall Oil Co. followed this procedure in the Newhall Potrero field of Los Angeles County and up until the present time has not drilled a dry hole. In view of the materials shortage it would seem advantageous to reduce pipe losses from abandonments to a minimum.

Operators Concentrate on Search for Heavy Crude

The demand for fuel oil has reached the point where something must be done to maintain or increase production of heavy crude oil because every indication points to the probability that demand for fuel oil later this year will be substantially higher than at present.

All operators are searching for areas that will produce a heavy grade of crude oil and many are going into districts where they know initial production and total recovery will be relatively small. Union Oil Co. is developing small production in the South Belridge field and General Petroleum Corp. is proceeding with drilling for heavy crude oil at Lost Hills, Belridge, Midway-Sunset and other districts. Tide Water Associated Oil Co. has been working for several months attempting to stimulate production of heavy crude oil in the Kern River field and has been meeting with outstanding success in its use of large capacity pumps some of which have been used in the past in the production of water.

Standard Oil Co. is also making a concerted attempt to develop additional production of heavy crude oil and accordingly will drill several outposts on fee-owned acreage out on the west front of the Kern River field provided the first well, scheduled to be spudded in within the next few days in 9-28s-27e, proves commercially productive. In addition to this work, Standard Oil Co. is drilling one well in the Midway-Sunset field and has locations staked or rigs up for 10 more. Chanslor-Canfield Midway Oil Co. and Signal Oil & Gas Co. are at present working on wells in the Mount Poso field of Kern County. The former is already in the pay with 4 Mon in 26-27s-28e, at Mount Poso and should have this well tanking oil within the next few days. Top of the Vedder zone of Miocene age was at 1,427 ft. and the oil sand continued down to 1,448 ft., a normal thickness. The Vedder zone at Mount Poso and in the Round Mountain and other similar fields is exceptionally productive although the zone is relatively thin, usually between 20 and 35 ft.

General Petroleum Corp. was recently granted permission to proceed with drilling operations on 61-33 Gallagher in the Paloma gas-distillate field of Kern County and the company is at present drilling ahead at 5,500 ft. The objective of this well is the Paloma gas and distillate sand at approximately 10,000 ft. This well was spudded several months ago but was on the suspended list for some time because it did not conform with provisions of M-68. If General Petroleum chooses it will be eligible to join the present restricted unit plan of operation now being conformed to the Western Gulf Oil Co., Texas Co. and Ohio Oil Co. Under the provisions of the present operating plan any new well can be brought into the unit plan with a 40-acre unit around the well after completion. An attempt was made last year to form a complete unit for operation ow the gas-distillate development but one operator refused to agree to the provisions of the plan and thus Western Gulf, Texas and Ohio Oil Co. found it necessary to proceed with unit plans on a smaller scale. These three operators recently completed a series of tests using a pilot plant to furnish the necessary data upon which to base specifications for the new repressuring plant to be built in the Paloma field in the near future. It is to be regretted that the Paloma distillate field cannot be developed as a single unit as this would have permitted maximum production and the application of good engineering principles. Under diversified operation it will be necessary to build two or more plants to do the work that could be done with one large unit. All present production in the Paloma field has been developed by Western Gulf, Texas and Ohio and with one exception is located on property owned in fee by Kern County Land Co. The one exception is the well drilled jointly by Western Gulf and Texas Co. on the Symons property in the extreme eastern end of the field. The next well to be drilled in this field will be Gulf 36-1 on property owned by Los Angeles Athletic Club in 1-32s-26e.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge, North, Kern County: Belridge Oil Co. 31-R-28 fee, 28-27s-20e, flowed 125 bbl. 30.1-gravity, 0.1 per cent cut, 128/64-in. bean, T.D. 8,794 ft., perf. 8,712-94 ft., would not flow on completion, injected gas, producing from second Wagonwheel zone of Eocene age.

Belridge, South, Kern County: General Petroleum Corp. 40 Belridge, 3-29s-21e, pumped 65 bbl. 14.1-gravity oil, 5 per cent cut, T.D. 951 ft., perf. 510-696 ft., 743-65 ft., 788-853 ft., completed in upper zone of Pliocene age.

Union Oil Co. 41-10 Hopkins, 10-29s-21e, flowed 70 bbl., 14.4-gravity, 20 per cent cut, 500,000 cu. ft. gas, open line, T.D. 2,298 ft., P.B. 1,200 ft., perf. 1,057-1,173 ft., 1,177-97 ft., completed in upper zone of Pliocene age.

Coalinga, East, Fresno County: Standard Oil Co. 102-35-A fee, 35-19s-15e, pumped 75 bbl. 22.4-gravity, 0.1 per cent cut, T.D. 3,126 ft., perf. 2,806-3,030 ft., completed in East Coalinga oil sand of Pliocene age.

Coalinga, West, Fresno County: Texas Co. 1-A-B Pleasant Valley Farming, 6-20s-15e, pumped 45 bbl., 13.9-gravity, 60 per cent cut, T.D. 1,476 ft., perf. 1,415-76 ft., completed in West Coalinga oil sand of Pliocene age.

Raisin City, Fresno County: Seaboard Oil Corp. 86-13 S.U.T., 13-15s-17e, flowed 10,000,000 cu. ft. gas, 38/64-in. bean, T.D. 5,320 ft., P.B. 5,110 ft., perf. 4,997-5,008 ft., 5,095-5,106 ft., formation test 5,010-31 ft., recovered 60 ft. drilling mud, slight blow, formation test 5,096-5,116 ft., recovered 1,500 ft. oil, no water, set 7-in. casing and perf. 5,130-40 ft., formation test recovered 2,634 ft. oil, ran liner, flow by heads, perf. 5,110-20 ft., formation test recovered 93 ft. sand, 465 ft. gas-cut mud, 1,650 ft. salt water, squeezed, perf., P.B. 5,110 ft. and completed in gas zone.

Prospective Producer on Ramona Anticline Due for Test

Continental Oil Co. appears to have a producer in 1 Holser on the Ramona anticline east of Piru in 14-4n-18w, and a production test is scheduled to be made within the next few days. A water shutoff test is being made on the 7-in. landed at 4,105 ft. and if this proves effective the company will proceed with the production test. This wildcat is bottomed in shale at 4,348 ft. and has about 200 ft. of oil sand above this point. The only question about this well is whether the oil sand has enough porosity to permit a large production. The oil tests 30-gravity A.P.I., but the well does not appear to have much kick. Core recoveries have not been especially good and for this reason there is some doubt about the permeability and porosity of the oil sand. Saturation is good, however, and it would therefore appear quite probable that the well will produce. The age of the formation has not been definitely determined but it now appears that it might be upper Miocene. The Ramona anticline is a sharply faulted structure with steep dips and for this reason the productive area might be limited in areal extent. The sand is high enough, however, to result in low drilling costs and for this reason a relatively small well would prove commercially profitable.

Wildcat Spudding Southeast Of Newhall Potrero

Barnsdall Oil Co. has spudded 1 T.I.T. in the San Francisco reservoir area of Los Angeles County and this wildcat is making good progress. This wildcat, which is being drilled in conjunction with Seaboard Oil Co., is located a little less than 5 miles south of Newhall and about 9 miles southeast of the Newhall Potrero field. The new wildcat, in 30-3n-15w, is about 1,500 ft. east of the Owens River Aqueduct spillway and prospecting work is the result of considerable study of the area and the presence of substantial oil and gas seepages in shallow wells drilled in the region to develop a source of water. This area has considerable merit and will bear watch-

ing as the well is in a good oil region on a fairly promising structure.

Richfield's attempt to develop production in a deep sand in the Ojai region of Ventura County appears nearing an end as the best the company's 44 Ojai in 13-4n-22w, would do is a few hundred barrels of salt water along with a small quantity of oil. This deep test was drilled to 8,755 ft. but has been plugged back to 5,111 ft.

Water Stops Drilling in Gato Ridge Test

Republic Petroleum Co. has suspended drilling operations on 1 Price in the Gato Ridge field of Santa Barbara County following the failure to effectively shut off water and salvage enough oil sand to result in commercial production. This outpost was drilled to 4,994 ft. and later plugged back to 4,570 ft. when bottom water was encountered. A test of the interval 3,812-4,033 ft. showed no fluid and a test at 4,360-4,485 ft. showed water with only a trace of oil. This outpost was drilled in 16-8n-32w, and would have greatly extended the productive limits of the Gato Ridge field if finished as a commercial producer. Tide Water Associated Oil Co. has derrick standing for 1 Davis to be drilled in 33-8n-31w, and this well will likewise extend the proved limits of the field if finished as a good well.

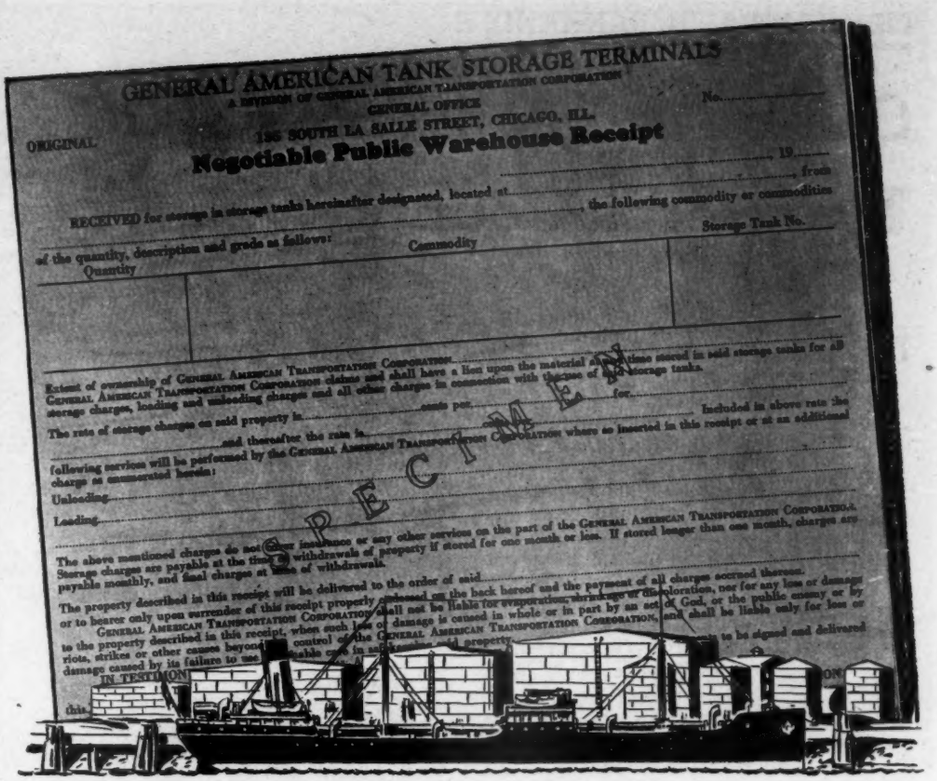
Third Turnbull Canyon Well Is Running Very Low

There has been no change for the better this week in Continental's third well in the Turnbull Canyon field of Los Angeles County and with increased depth the outlook is not any too bright. At 4,850 ft. Continental's present well is over 1,400 ft. below the original discovery well and is going ahead in a gray sand and shale. The Turnbull Canyon zone found in the first two wells showed only as gray sand with thin streaks of oil sand in the present well and therefore the well's only hope now lies in finding a new productive zone. The results of development to date do not appear to correlate at all with original geological expectations and for this reason the exact structural conditions prevailing are undetermined. The Turnbull Canyon field, discovered by Continental Oil Co. in 1941 does not look at all promising as far as large production is concerned, in fact it would be surprising if the field showed large sustained production. It now looks as if the only large production will be developed adjacent to the Turnbull Canyon fault. However, to date all development work has been in a limited area and expansion of work may reveal a different condition than now appears apparent.

"Indoor Oilfield" Strikes Snag

The attempt of J. E. Elliott and Shell Oil Co., Inc., to secure permission to drill a deep test in the old Salt Lake field by using a soundproof and odorproof building from which wells would be drilled by directional drilling to intercept a deeper sand appears scheduled to run into a lot of trouble. Protestants of the plan, headed by C. R. Livengood, president of the Wilshire District Civic League, told a joint meeting of the Los Angeles planning and water and power committees that, "We have here a promotion wrapped in an American flag and we request further time in which to organize opposition to the proposal." In contrast with this objection, Secretary of the Navy Frank Knox came out in favor of the plan by writing the Los Angeles planning committee: "The needs of the armed forces of the United States, and war production industries in the Pacific area for petroleum products make it imperative that all possible sources of new production be examined in an effort to increase California oil reserves. For this reason,

(Continued on Page 85)



Extra room and extra capital— when you need it!

Not only do General American Terminals provide needed storage space for your bulk liquids—they also make extra capital available. A General American Warehouse Receipt is accepted as finest collateral for financing. Enjoy every modern safeguard, every unique economy of this strategic network, without any investment on your part. It's good business, particularly in war time, to check your storage problems with General American.

ONLY GENERAL AMERICAN GIVES ALL THESE ADVANTAGES:

1. *RELIABLE CUSTODIANSHIP.* Our warehouse receipts are highest type of collateral everywhere.
2. *MODERN PROTECTION.* Latest safety appliances; lowest insurance rates; minimum evaporation losses.
3. *INDEPENDENT OWNERSHIP.* Strictest privacy. We do not buy, sell or refine any oils.
4. *NO WHARFAGE.* There is no wharfage charge at our own private docks.
5. *SPEED WITH SAFETY.* Day and night crews, complete facilities, eliminate all shipping delays.
6. *LARGE TANK CAR FLEET.* Now working night and day, delivering essentials of war.
7. *NO CONTAMINATION.* Separate pumps, lines, storage zones for dissimilar commodities.

KEEP 'EM ROLLING! Freight cars—particularly tank cars—are vital to Victory. They must be loaded, unloaded, kept moving with all possible speed. Delays may cost lives!

GENERAL AMERICAN TANK STORAGE TERMINALS

GOODHOPE and WESTWEGO, LA. (Port of New Orleans)
CARTERET, NEW JERSEY (Port of New York)
CORPUS CHRISTI, TEXAS GALENA PARK, TEXAS (Port of Houston)

A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORP.

Cambrian Pay Reported in Two Pecos County Wells

By ROBERT INGRAM

MIDLAND, Tex.—Another deep pay zone below the Ordovician lime, was being opened to production and added to the huge reserves of the Permian basin of West Texas last week. It was the Hickory section of Middle Cambrian age It was showing production in two wells about 25 miles apart in Pecos County.

First to be reported was Skelly Oil Co. 2 Crockett, Section 5, Block 110, T.C. Survey, on the east side of the southern part of the Apco-Warner pool, currently producing from 18 Ellenburger (Ordovician) wells. From an elevation of 2,463 ft., the well went through the Ellenburger at 4,230-4,710 ft. and into the Hickory. It was drilled to 4,969 ft. in sand and dolomite, and 5½-in. casing was set at 4,767 ft. for a test.

The second Cambrian showing was at Gulf Oil Corp. and L. H. Wentz 3 L. H. Millar et al, Section 43, Block 11, H.&G.N. Survey, 1½ miles northwest of the No. 2, Ordovician discovery well completed recently after months of testing (see The Oil and Gas Journal, May 28, p. 92). This well was bottomed at 4,386 ft. in sand, with 8¾-in. hole having been reamed to 4,355 ft. where 7-in. casing was to be set. Ellenburger was reported at 4,167-4,376 ft., and on a drill-stem test from 4,365 ft., the well recovered 283 ft. of oil and 130 ft. of drilling fluid in 1 hour.

At one time, it was reported that Olson-McCandless 1 Crockett, in the southern part of the Apco-Warner pool, had found an increase in pay in the Hickory, but a recent study of the section indicated that it was granite wash.

Testing at Edwards Plateau Show

Attempts were still being made to get a producer in the Ellenburger at S. B. Roberts and M. C. Moore 1 Allison, Section 4, Block K, G.H.& S.A. Survey, in Sutton County, on the Edwards Plateau. The first test of the Ellenburger, topped by steel-line measurement at 5,174 ft., was disappointing, returning only rainbows of oil and a slight amount of gas. The well was deepened to 5,416 ft. with no change, and operator was planning to perforate the 5½-in. casing, which was set at 5,348 ft., in upper levels where shows were reported.

New Delaware Sand Pool Showing

J. E. FitzPatrick and Fred Hyer 1 T. B. Pruitt, Section 23, Block I, W.&N.W. Survey, 4 miles northeast of Monroe in northwest Ward County, swabbed oil at the rate of 50 bbl. a day from Delaware sand earlier in the week to show strong possibility of a new pool. The well logged a slight show of gas at 4,820 ft., a show of oil from 4,832-43 ft. and an increase in oil from 4,847-53 ft. in sand. Top of the Delaware black lime was given at 4,814 ft., and the Delaware sand at 4,847 ft. Total depth was 4,858 ft. Five-and-one-half-inch casing will be run at 4,650 ft. for a pay test and the section may be shot.

Sixth Well Completed at Barnhart

The sixth Ordovician producer in the new Barnhart field in Reagan County, R. R. Ogden and R. H. Hawn 2-A University, SE NE Section 2, Block 48, University Survey, flowed 378 bbl. of oil in 7 hours from a total depth of 9,172 ft., and rig was skidded south to start the 1-A University, NW NE Section 9, 1 mile east of Amerada 1-B University.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

Crockett County: Ungren & Frazier 1 W. T. Noelke, 2,677 ft. from N line and 1,845 ft. from E line Sec. 54, W. H. B. Lewis Sur., about 4 mi. south and slightly east of Noelke pool, elev. 2,260 ft., dry, Yates sand 890 ft., lime 1,655 ft., T.D. 2,000 ft.

Fields

Abell, Pecos County: George T. Abell 1-B H. J. Eaton, 990 ft. from SE and NE lines of lease, Sec. 5, Blk. 3, H.&T.C. Sur., elev. 2,393 ft., dry, Simpson 4,895 ft., Tulip Creek 5,060 ft., Waddell 5,833 ft., T.D. 5,873 ft.

Abell Ordovician, Pecos County: Magnolia 3 Francisco, 660 ft. from N line and 611 ft. from W line Lot 12, Sec. 4½, Blk. 3, H.&T.C. Sur., 1,610 ft. north of No. 2, elev. 2,390 ft., flowed 41 bbl. oil plus 55 bbl. sulfur water through ½-in. tubing choke on gas lift, Simpson 4,850 ft., McKee 4,942 ft., Waddell 5,437 ft., Ellenburger 5,815 ft., pay 5,830 ft., T.D. 5,920 ft.

Clara Couch, Crockett County: Humble 1-F Owens, NE NW Sec. 15, Blk. GG, G.C.&S.F. Sur., west offset to No. 1-D, elev. 2,620 ft., dry, sulfur water 2,107 ft., T.D. 2,111 ft.

Emperor, Winkler County: Skelly 48 Halley, NE SW Sec. 15, Blk. B-11, P.S.L. Sur., elev. 2,763 ft., flowed 567 bbl. through ½-in. tubing choke after shot, pay 2,750 ft, T.D. 2,885 ft., *south edge well.*

Goldsmith, Ector County: Continental 1-B-31 Kloh, NE NE NE Sec. 31, Blk. 45, Twp. 1n, T.&P. Sur., elev. 3,256 ft., flowed 104 bbl. through ¾-in. tubing choke after acid, pay 4,240 ft., T.D. 4,290 ft.

World, Crockett County: M. & M. Production 1-B Powell, NW NW Sec. 62, Blk. BB, E.L. Sur., elev. 2,801 ft., pumped 176 bbl. after acid, pay 2,657 ft., T.D. 2,660 ft.

Three Outposts in New M-Bar Pool Nearing Completion

Three outposts in the new M-Bar pool of southwestern Andrews County were in the Permian lime pay last week. A mile and one-quarter northwest of the discovery well (an Ordovician producer which showed production in the Permian), Phillips Petroleum Co. 6 University-Andrews, Section 25, Block 11, was coring below 4,247 ft. in lime and was showing oil and intermittent porosity.

One mile to the south of this well, Phillips 5 University-Andrews, Section 36, Block 11, was bottomed at 4,254 ft. in lime, and was reaming to core ahead after it showed gas-cut drilling mud on a drill-stem test.

Meantime, about 2⅝ miles northwest of the discovery well and offsetting Atlantic 1-23 University, a small Permian lime producer in the West Andrews field, Phillips 8 University-Andrews, Section 14, Block 11, had cemented 8⅝-in. casing at 4,269 ft. and was ready to drill plug for a test. Dolomite with some porosity and saturation was recovered from cores at 4,375-4,460 ft., total depth, but large size casing was run to keep the hole in condition to be deepened to the Ordovician if such seemed advisable later.

Phillips has three other tests drilling in the area—one to the Permian and two Ordovician tests. All were started to protect leases which begin expiring June 25 unless production is developed earlier, and are part of one of the most concentrated drilling campaigns in the Permian basin at present.

Try for Completion at Lubbock

In southeastern Lubbock County, where production, discovered in November 1941, was moved north and east to a point that suggested a large new possible area extending to the trend of production in Foard, Wilbarger, and Wichita counties from the present Permian basin fields, Stanolind Oil & Gas Co. was trying to get a second pool. It was Stanolind 1 J. F. Stinnett, SW SW Section 18, Block 4, San Augustine Survey, 6 miles southeast of last fall's discovery at the Nairn well.

After being drilled to 7,000 ft. in search of deep pay zones, the well was plugged back to test shows at 6,546 ft., 5,500 ft., around 5,100 ft., and finally at the first and best show at 4,681-4,755 ft. It was at this level, perhaps comparable to the pay at Nairn at 4,884-5,002 ft., that the completion attempt was being made last week. The well bailed 6 bbl. of salty water with a scum of oil in 7 hours after 7-in. casing was perforated at 4,728-49 ft. and at 4,691-4,728 ft. Plug-back depth was 5,387 ft. At week's end operators were preparing to acidize in an attempt to increase the oil show.

Meantime, in Lamb County, adjoining Lubbock on the northwest, Stanolind 1 Topping, Section 25, Block 7, T. A. Thompson Survey, was drilling below 8,529 ft. in crystalline brown lime and shale. Originally contracted to 8,500 ft., the test is being carried to granite. No shows have been reported so far.

Sou'h Edge Well at Slaughter

On the south edge of the Slaughter pool in northwestern Terry County, DeKalb Agricultural Association 1 M. E. Jacobson, Section 6, Block D-11, John H. Gibson Survey, was given a potential of 919 bbl. of 31-gravity oil after acid treatment in pay at 5,022-48 ft., plug-back depth. Gas-oil ratio was 514:1. The potential compared favorably with other wells in the field and indicated more outpost drilling. DeKalb immediately staked 2 Jacobson, a west offset, 2,086 ft. from the west and south lines of Section 6.

NORTHERN WEST TEXAS COMPLETIONS

Wildcats

Andrews County: Mascho Oil 1 Sun-University, 660 ft. from E and N lines Sec. 27, Blk. 10, University Sur., elev. 3,216 ft., pumped 178 bbl. after shot, anhydrite 1,730 ft., Yates frosted grains 2,920 ft., Brown lime 3,830 ft., pay 4,420 ft., T.D. 4,514 ft., *opens new pool 2 mi. northwest of Emma pool.*

Fields

Cedar Lake, Gaines County: George P. Livermore 1 Humble-Jones, SE SE Sec. 2, Blk. 30-C, P.S.L. Sur., elev. 3,086 ft., swabbed 264 bbl. through casing, pay 4,775 ft., shot, T.D. 4,803 ft., P.B. 4,800 ft., *northeast edge well.*

Slaughter, Hockley County: Honolulu 21-A Mallett, NE NE Lab. 7, Lge. 52, Scurry C.S.L. Sur., elev. 3,584 ft., flowed 785 bbl. through casing after acid, pay 4,996 ft., TD 5,034 ft.

Wasson, Yoakum County: Drilling & Exploration 9-C Hudson, SW NW Sec. 834, Blk. D, J. H. Gibson Sur., elev. 3,665 ft., pumped 286 bbl. oil plus 7 per cent water after acid, pay 4,910 ft., T.D. 5,120 ft.

Shell 16-D Baumgart, NE NW SE Sec. 826, Blk. D, J. H. Gibson Sur., elev. 3,558 ft., flowed 1,463 bbl. through tubing, acid, pay 4,900 ft., T. D. 5,158 ft.

TEXAS PANHANDLE

AMARILLO, Tex.—The Humble wildcat planned for Hall County is still awaiting completion of the Matador ranch test in Motley County. The latter is reported below 7,000 ft. and is to be drilled to 8,000 ft. In Lamb County, just southeast of the town of Fieldton, Stanolind's wildcat is reported at 8,605 ft. Contract depth was originally 8,500 ft. but the company decided to go ahead to 9,500 ft., pay or granite. In northern Dallam County, Pure has derrick up for 1 Federal Land Bank, Section 17, Block 7, 11 miles north of Ware. The test is to be drilled "tight."

Geophysical work in the Panhandle is reported active with Phillips leading with gravimeter parties in the northeastern area, Collingsworth and Randall counties and a core drill in Dallam County. Pure is reported core drilling in Hartley County and Stanolind has a seismograph crew in Oldham County and a magnetometer crew in Hart-

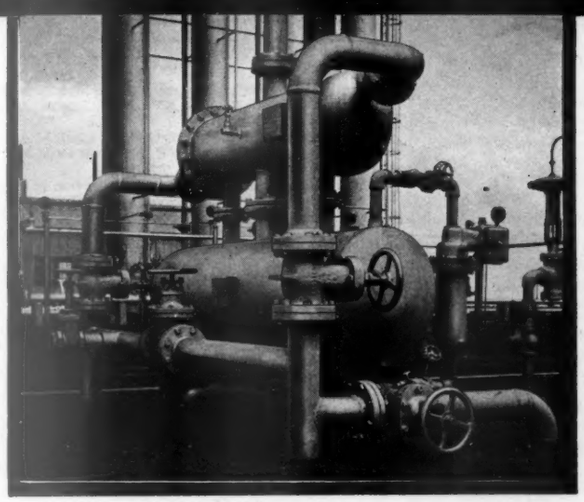
(Continued on Page 85)

Controlling

THE NATION'S MECHANIZED POWER

★

WESTCOTT VALVES



Westcott Valves are an example of one of the many precision tools behind the Nation's mechanized power.

There is no place on today's pipe line for an inferior valve —there can be no question of dependability—the *oil must be delivered.*

Westcott Valves were designed with the aid of the pipe line operators and are made by the only exclusive manufacturer of valves for the oil and gas industries.

Positive wedging type action for perfect closures against mirror-like stellite faced seats—V-V Type asbestos packing, self adjusting to pressures for leak-proof seal—insure positive pipe line control.

Consult your nearest Continental Representative for complete information.

CONTINENTAL

SERVING THE OIL AND GAS INDUSTRIES

THE CONTINENTAL SUPPLY CO.
General Offices: DALLAS, TEXAS
Foreign Sales Subsidiary
CONTINENTAL EMSCO COMPANY, Inc.
30 Rockefeller Plaza New York City, N.Y.
Representatives:
London Maracaibo Buenos Aires Trinidad

★ BUY U. S. WAR BONDS & STAMPS ★

ILLINOIS FIELD REPORT

Extension of Main McClosky Trend Appears Imminent

MATTOON, Ill.—Illinois operators were completing four new pool openers as the week ended and two other wildcat tests were reported which tended to boost to 11 the number of discoveries in the Sucker State within the past 7 weeks.

Most promising of the new wildcat tests is the Deep Rock 1 Blackburn, NW NE 30-1s-7e, about 2½ miles west and ½ mile north of the Boyleston field, which headed up and began to flow when plug was drilled to the McClosky. However, no storage tanks had been set and the well was shut in until tanks can be erected and preparations made for testing. The Ste. Genevieve formation was topped at 3,186 ft. and the hole was drilled to 3,240 ft. before casing was cemented.

The Deep Rock discovery is located in Wayne County about 5 miles southeast of the Johnsonville pool and about 7 miles southwest of the Cisne field along a trend with the Dundas, Noble, Clay City and Cisne fields, all of which have produced prolifically from the McClosky.

Biehl Sand Pool Opened South of Albion

Another wildcat to arouse interest last week was S. C. Yingling 1 Perkins, NE SW SW 2-3s-10e, 3 miles south of the Albion field of Edwards County. At last reports the 1 Perkins was testing Biehl sand saturation at 1,953-72 ft. It was predicted that the well would make from 60 to 75 bbl. daily.

Other wildcat tests completed as pool openers last week included:

Lewis Production Co. 1 State Game Farm, SW SW SE 21-3s-3e, 4 miles south of Mount Vernon, which pumped 153 bbl. of oil and 10 bbl. of water in 24 hours from the Aux Vases at 2,740-62 ft. In a later test the well pumped 70 bbl. of oil and 10 bbl. of water in 10 hours. It has not been shot.

M. B. Bryant 1 Hugo Meyer, SW NE SE 16-3n-6w, Madison County, pumped natural at the rate of 118 bbl. daily on initial tests of the Trenton lime. Bryant has staked five locations near 1 Meyer, westernmost discovery of the year in the Tri-State basin.

Ike Taylor 1 Old Ben Coal Co., NE NW NE 19-5s-2e, Aux Vases discovery near Sesser in Franklin County, initialed 178 bbl. daily. The well is producing from saturation at 2,699-2,707 ft. Meanwhile, about ¾ mile south of Taylor's well, J. W. Menhall 1 Old Ben Coal, pumped at the rate of about 100 bbl. daily. It is probable that the two wells have tapped the same structure.

J. Hal Jones has completed his pool opener, 1 Neeley, NE NW NE 11-3n-7e, ½ mile east of the East Flora pool in Clay County, for 508 bbl. a day from the McClosky lime.

Offsets Staked to Gallatin Discovery

In Gallatin County two offsets to R. Bruce Martin 1 L. Bahl, a recent Cypress sand discovery have been started. They are Skelly 1 M. Hoge, SE NW SE 15-8s-9e, and Gulf 1 Bahl, SE NE SW 15-8s-9e. About 2 miles south of these wells, Martin and Tide Water 1 Leon Minor, SE NE NE 28-8s-9e, another discovery, was pumping about 30 bbl. of oil and 30 bbl. of water a day from the Tar Springs sand at 2,166-76 ft. Operators planned to shoot the well before completion.

ILLINOIS COMPLETIONS

Wildcats

Clark County: C. R. Craft 1 W. Finney, W½ NW NW 32-9n-14w, dry at 2,691 ft., St. Louis 1,295 ft., Salem 1,542 ft., Osage 1,789 ft., Devonian 2,504 ft., saturation 1,542-47 ft.

Clay County: Ill.-Prod. 1 Veith, SW NE 5-5n-7e, pumped 66 bbl., McClosky 2,808-12 ft., 2,813-18 ft., T.D. 2,837 ft., *extends Bible Grove ½ mile north.*

J. Hal Jones 1 Neeley, NE NW NE 11-3n-7e, flowed 508 bbl., 5,000 gal. acid, McClosky 2,940-52 ft., old well deepened from 1,530-2,958 ft., formerly dry hole, *pool opener.*

Crawford County: Curtis Oil 1 Lingafelter, NW SE NE 8-8n-13w, dry at 1,260 ft.

A. J. Foster 1 Jeff Link, SW NE SW 9-7n-14w, dry at 1,230 ft.

Edwards County: Sun 1 R. McKilliben, E½ SE SE 19-2s-10e, dry at 3,393 ft., base Pennsylvanian 2,188 ft., Kincaid 2,252 ft., Degonia 2,272 ft., Menard 2,453 ft., Waltersburg 2,500 ft., Glen Dean 2,697 ft., Hardinsburg 2,739 ft., Golconda 2,843 ft., Barlow 2,951 ft., Paint Creek 3,073 ft., Benoist 3,106 ft., Aux Vases 3,239 ft., Ste. Genevieve 3,268 ft., Rosiclare 3,280 ft., Fredonia 3,286 ft., St. Louis 3,378 ft., T.D. 3,393 ft.

Fayette County: Hawk & Rebey 1 J. W. Barkley, NE NE SE 2-5n-2e, location abandoned.

Franklin County: I. W. Taylor 1 Old Ben Coal Co., NE NW NE 17-5s-2e, pumped 132 bbl., Aux Vases 2,701-8 ft., T.D. 2,716 ft., *pool opener.*

Hamilton County: Whisenant & Trenchard 1 Hungate, SE NW 11-6s-5e, dry at 3,353 ft., Cypress 2,927 ft., Aux Vases 3,222 ft., Ste Genevieve 3,255 ft, Fredonia 3,325 ft.

G. L. White 1 A. W. Schnuck, S½ SW SE 35-3s-6e, dry at 3,452 ft., Tar Springs 2,671 ft., Glen Dean 2,715 ft., Golconda 2,843 ft., Barlow 2,961 ft., Cypress 3,025 ft., Paint Creek sand 3,149 ft., Renault 3,253 ft., Aux Vases 3,278 ft., Ste. Genevieve 3,301 ft., McClosky 3,410 ft.

Marion County: K. Harris et al 1 C. Huff, SE SE 33-2n-3e, location abandoned.

Montgomery County: Papoose 1 Whitten, NW NW NW 10-7n-2w, dry at 1,290 ft., Cypress 996 ft., Aux Vases 1,188 ft., Ste. Genevieve 1,214 ft., St. Louis 1,282 ft.

Richland County: Pure 1-A Hasler, SW SW 22-4n-9e, dry at 3,035 ft., Glen Dean 2,465 ft., Barlow

(Continued on Page 74)

MICHIGAN OPERATIONS

Flush Fields Face Downward Revision of Allowables

By OTTO C. PRESSPRICH

SAGINAW, Mich.—Michigan's Oil Advisory Board has deferred action on changes in well allowables but indicated a downward revision may be ordered before the end of June for the Reed City field where indications are that production is at maximum safety rate. OPC has notified state officials that the total recommended allowable for Michigan for the month is 63,100 bbl. a day, which is approximately the production figure for May.

Reduction in Michigan crude shipments to the eastern seaboard is likely, according to F. R. Frye, state petroleum engineer. For a time shipments average above 8,200 bbl. a day, but that volume has been declining because of transportation shortage and a bigger localized demand.

Oil-field developments last week resulted in 19 completions, including 11 dry holes, mostly wildcat tests, 6 producing oil wells and 2 gas wells. The completions report included Turner Petroleum Corp. 1 Cavanagh wildcat in Section 14 of Riverside Township, Missaukee County, which gaged 329 bbl. in 19 hr., pinched, after acid treatment. Gulf Refining Co. offset, however, was dry, and the result has been a falling off in optimism over possibility of a new field.

Best well of the week was Ohio Oil Co. A-1 Heilman in Section 20 of Lincoln Township, Osceola County. That Reed City producer flowed about 70 bbl. an hour. In Osceola's Richmond section C. L. Maguire, Inc., added 1 Johnson to the producing list, acidizing for 240 bbl. a day. The two gas wells are Taggart Brothers developments in Osceola Township.

MICHIGAN COMPLETIONS

Allegan County, Hopkins Township: Sprenger Bros. 1 Buseena-Hoerner, C S½ NE SE 7-3n-12w, dry, T.D. 1,637 ft.

Wayland Township: H. C. Williams 1 Afman, SE SE NE 30-3n-11w, wildcat test, dry, T.D. 1,958 ft.

Arenac County, Deep River Township: Arenac Oil & Gas Co. 1 Kocot, NE SW NW 16-19n-4e, gas test, dry, T.D. 1,544 ft.

Bay County, Monitor Township: Gulf Refining Co. 1 Marion, C S½ SE SW 1-14n-4e, pumping 70 bbl. daily, acidized, T.D. 2,867 ft.

Clinton County, Bingham Township: H. C. Williams 1 Skutt, NE SE SE 11-7n-2w, wildcat test, dry, T.D. 2,827 ft.

Gladwin County, Bourret Township: Mogul Oil Co. 1 Bensch, C N½ NW NW 7-20-2e, wildcat test, dry, T.D. 3,530 ft.

Lake County, Sauble Township: Charles W. Teater 1 Teater-Walker, C NE NE NW 16-19n-14w, wildcat test, dry, T.D. 2,180 ft.

Missaukee County, Riverside Township: Turner Petroleum Corp. 1 Cavanagh, C N½ SE NW 14-21n-7w, wildcat, produced 329 bbl. in 19 hr. after acid, pinched, T.D. 3,947 ft.

Gulf Refining Co. 1 Cavanagh, C N½ NE SW Sec. 14, wildcat test, dry, T.D. 3,953 ft.

Osceola County, Lincoln Township: Ohio Oil Co. A-1 Heilman, C S½ NE NW 20-18n-10w, acidized for 1,560 bbl. daily, T.D. 3,625 ft.

Osceola Township: Taggart Bros. Co. 12 Lauman-Conover, C SE 21-18n-8w, gas well, 672,000 cu. ft. daily, T.D. 1,472 ft.

Taggart Bros. Co. 13 Wilcox-Snyder et al, C SW Sec. 27, gas well, 4,172,000 cu. ft. daily, T.D. 1,412 ft.

Richmond Township: C. L. Maguire, Inc., 1 Johnson, C N½ SW SE 5-17n-10w, acidized for 240 bbl. daily, T.D. 3,558 ft.

Ottawa County, Talmadge Township: John C. Newell 1 Bronkema, C E½ SW SW 14-7n-13w, acidized to produce 225 bbl. oil, plus salt water, T.D. 1,875 ft.

Schoolcraft County, Hiawatha Township: B. P. Pattison 1 Verschure, NW NE NE 14-42n-16w, wildcat test, dry, T.D. 1,050 ft.

Van Buren County, Bangor Township: Purl R. Zook 4 Starz, NW SW SE 21, acidized to produce 350 bbl. daily, T.D. 1,005 ft.

Decatur Township: Clapsaddle & Harris 1 Stanek, SW NE SE 3-4s-14w, wildcat test, dry, T.D. 1,128 ft.

Geneva Township: Smith Petroleum Co. 1 Citizens State Bank, E½ NE NW 28-1s-16w, wildcat test, dry, T.D. 1,044 ft.

Hartford Township: Muskegon Development Co. 1 Finley, C W½ NE NE 11-3s-16w, wildcat test, dry, T.D. 1,338 ft.

First new production in months resulted in Talmadge Township of Ottawa County as J. C. Newell brought in 1 Bronkema for 225 bbl. a day. Dry holes included wildcat tests in Schoolcraft and Clinton counties, as well as others in Allegan and Van Buren, leaders of a few years ago.

Three Operations Started in Oregon Basin Field

By T. R. INGRAM

DENVER, Colo.—The Oregon Basin field in the Big Horn basin in Wyoming stepped into first place in drilling activity the past week with the starting of three new operations by the Ohio Oil Co. Same company has one well nearing completion and other companies have four wells under way. All are within the proven area and the activity is due in part to lease requirements under the recent sale of government leases and to the necessity of drilling offsets.

The General Petroleum Corp. drilling program in Wyoming for 1942 is now getting into full swing with one well in Cole Creek now being completed, another rigging up, its wildcat on Antelope Gap in Platte County having spudded, another wildcat on Horse Creek in Laramie County scheduled to get under way the latter part of this month, and its test on South Cole Creek drawing close to the first objective in the Shannon sand. Last named is listed on some maps as the Lone Tree structure and on others as North Muddy.

The fourth well drilled by W. H. Connor in the Dewey district in Weston County, a test to the Minnelusa, reached that horizon at 1,700 ft., and found water. It had a show in the Sundance. Location was approximately ½ mile northwest of Bruce C. Teeter 1 State which tested the Minnelusa in 1940 without results and then found a show of oil in the Sundance at 980-1,017 ft. to be noncommercial. The other wells were to the south and southeast and went only to the Sundance.

Texas Co. has made a location for 11 Unit on Wilson Creek, Rio Blanco County, Colorado, joint operation with the California Co., in the NW cor. 34-3n-96w, an outside well on the west side. Its 10 Unit, an outside well on the east side, is bottomed at 7,198 ft., and a near completion.

Three Wells Starting at Pilot Butte

A drilling program for the Pilot Butte field, following a 750-bbl. discovery in the Tensleep last month in the Superior Oil-British American 1 Tribal, is getting under way. Location has been released for 2 Tribal in the NE NW SW 15-3n-1w, a joint operation to be drilled by Superior, a little less than ½ mile north of the discovery. Superior 1 Stock, SE NE NE Section 21, which is not a joint operation, is ⅜ mile to the southwest of the discovery. British American also will drill an independent well, location not yet released, but probably in the NW NW Section 22.

J. D. McKenzie 1 Tribal, NW SW NW 29-32n-5w, at the south end of the Cut Bank field in an area which has furnished some of the largest wells in the field, failed to find commercial production in the Cut Bank sand at 2,865 ft., total depth, and will be drilled on down to the Madison, which has never been tested in that part of the field. Dr. McKenzie is a Havre physician who purchased the lease on which his well was drilled at auction for a bonus of $214 an acre. It looked like a sure shot. After cementing his surface pipe, drilling was held up under M-68 because the location did not conform to the field pattern. However, all the operators joined in a request for an exception under the order and he was authorized to go ahead and complete his well.

Montana Production

Montana crude-oil production in April was 648,719 bbl. from all fields as reported by the state Oil Conservation Board. This was a decrease of 15,094 bbl. as compared with March. Storage at the end of April was 1,451,639 bbl., including crude in the hands of producers, transporters, and refiners, an increase of 127,237 bbl. Exports to Canada dropped from 70,528 bbl. in March to 55,459 bbl. in April.

WYOMING COMPLETIONS

Dewey district, Weston County: W. H. Connors 4, CNL NE NW 36-42n-62w, water in top of Minnelusa, small show oil in Sundance, dry at 1,700 ft.

Lance Creek field, Niobrara County: Continental Oil 5 Rodeo-3, SW SW SE 26-36n-65w, T.D. 4,135 ft., 6⅝-in. 4,112 ft., swabbed 12 bbl. an hr. from the basal Sundance.

MONTANA COMPLETIONS

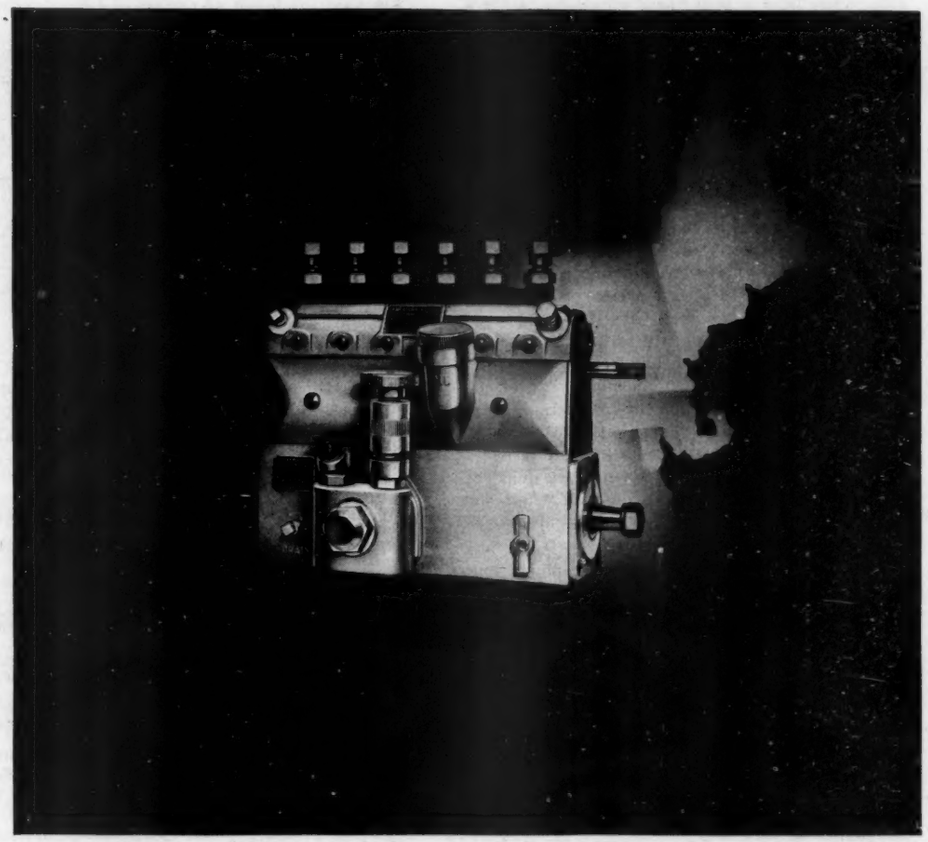
Cut Bank field, Glacier County: A. B. Cobb & Co. 1 Tribal-211, SE SE SW 19-32n-5w, T.D. 2,943 ft., 7-in. 2,881 ft., Cut Bank sand 2,880-2,928 ft., main pay 2,914-28 ft., swabbed 105 bbl. before shot 2,911-32 ft., cleaning out and swabbing.

Levi Burd 1 Tribal-214, C SW NW 18-32n-5w, T.D. 2,843 ft., 6¼-in. 2,790 ft., show oil in Sunburst at 2,750-63 ft., Cut Bank 2,790-2,822 ft., main pay 2,820-22 ft., P.B. to 2,825 ft., swabbed 33 bbl., to shoot.

Kevin-Sunburst field, Toole County: Nepstad-Mont-

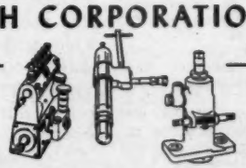
(Continued on Page 79)

SYMBOL OF
NEW ENGLAND CRAFTSMANSHIP



AMERICAN BOSCH
DIESEL INJECTION EQUIPMENT

AMERICAN BOSCH CORPORATION SPRINGFIELD, MASS.
BRANCHES: NEW YORK, CLEVELAND, DETROIT, CHICAGO, SAN FRANCISCO



Iuka and Dayton Pools Are Extended One Mile

By CARL HOOT

KANSAS completion reported last week were the highest since February with 9 wildcats and 27 field tests finished. Routine field operations have picked up as well as wildcat activity. Several wildcats are showing for pool openers and extensions to proven areas have been numerous.

Among the extensions to old pools was Hannum Drilling Co. et al 1 Beck, SW cor. 6-27-12w, Pratt County, which flowed by heads on a drillstem test in Simpson formation found at 4,240 ft. Operator will drill ahead to test the Arbuckle before setting casing. Location is approximately a mile north and east of the Iuka pool.

In northwestern Kansas, a 1-mile south extension to the Dayton pool found saturation in Lansing-Kansas City lime topped at 3,128 ft. and also in the Kansas City lime at 3,178 ft. It is Allan & Cohen 1 Weinman, SE SE 2-3-19w, in Phillips County. If productive, it will be the eighth well for the comparatively new pool. Some 5 miles northwest of the Dayton pool, Sinclair Prairie Oil Co. 1 Martin Johnson, NE NE NW 33-1-19w, has rigged up for a semiwildcat test.

Lindsborg Pool Active

Additional outpost tests for the Lindsborg pool of McPherson County were announced last week. Dickey Oil Co., which last week extended the pool a mile south when oil filled the hole in its 1 Rundberg and which is still testing after acidizing, has spudded in its 1 Lander, W½ NE NW 19-17-3w, a west offset. On the north end of the pool and ½ mile from present production, J. E. Mabee has started 1 Carlson, W½ SW SE 6-17-4w, having three 80-acre tracts in Section 6, including the east half of the southeast quarter; the west half of the southeast quarter, where the well is being drilled, and the south half of the southwest quarter.

The third producer for the new Deichman Bartlesville sand pool in Cowley County promises to be one of the largest found in the state. Trees Oil Co. 1 Franks, SE NE SE 23-31-4, was reported to have flowed 330 bbl. of oil in 2½ hours after a shot at 2,862-92 ft. Top of sand was 2,860 ft., while in the other two wells the top of sand was 2,839 ft. and 2,841 ft. It is about 2 miles east of the Hittle pool.

KANSAS COMPLETIONS

Wildcats

Ellis County: N. Appleman 1 Jantzen, SW SW SE 16-12-16w, dry, T.D. 3,498 ft., Topeka 2,825 ft., Lansing 3,136 ft., conglomerate 3,420 ft., Arbuckle 3,448 ft.

J. H. Bloch 1 Warner, NE cor. 4-11-18w, dry, T.D. 3,606 ft., Topeka 3,005 ft., Lansing 3,299 ft., Simpson 3,570 ft., Arbuckle 3,597 ft.

Ellsworth County: I. W. Murfin 1 Besthorn, NW NW SE 16-17-10w, dry, T.D. 3,385 ft., Topeka 2,650 ft., Lansing 3,005 ft., conglomerate 3,327 ft., Arbuckle 3,355 ft.

Marion County: Westgate-Greenland 1 Fellingham, SE NE NE 28-21-3, dry, T.D. 3,073 ft., Mississippi lime 2,563 ft., Hunton 2,860 ft., Viola 2,923 ft., Simpson 3,010 ft., Arbuckle 3,042 ft.

Norton County: Stanolind 1 Steelsmith, SW cor. 28-4-24w, dry, T.D. 3,932 ft., Lansing 2,480 ft., base Kansas City 3,696 ft., conglomerate 3,824 ft., Arbuckle 3,843 ft., granite 3,920 ft.

Pawnee County: Cities Service 1 Evans, NE SE SW 18-21-17w, dry, T.D. 4,038 ft., Winfield 2,050 ft., Fort Riley 2,150 ft., Florence 2,270 ft., Topeka 3,119 ft., Lansing 3,530 ft., base Kansas City 3,796 ft., sand 3,892 ft., weathered granite 4,011 ft., granite 4,032 ft.

Phillips County: Carter 1 Robb, SE SW 3-4-18w, dry, T.D. 3,597 ft., Topeka 2,980 ft., Lansing 3,121 ft., show oil 3,199-3,201 ft.

South of Dayton pool: Helmerich & Payne 1 Miller, SE NW 11-3-19w, dry, T.D. 3,630 ft., Topeka 2,980 ft., Lansing 3,208 ft.

Russell County: Skelly 1 Lewis, NW NW NE 16-14-13w, dry, T.D. 3,372 ft., Lansing 3,020 ft., base Kansas City 3,312 ft., Arbuckle 3,347 ft.

Fields

Abbeyville, Reno County: Skelly 1 Milburn, N½ NW SE 24-24-8w, pumped 400 bbl., Lansing 3,528-41 ft.

Beaumont, Greenwood County: K. T. Weideman 14-A Lewis, SW NW SW 25-27-8, 600 bbl. potential, pumped 25 bb. an hr., Mississippi lime 2,465-82 ft.

Bemis, Ellis County: Cities Service 14-B Calahan, NW NW SE 25-11-17w, dry, T.D. 3,530 ft.

Cities Service 1 DeHoff, NW cor. 30-11-16w, 2,991 bbl. potential, Arbuckle 3,334-68 ft.

Chase, Rice County: McPherson Drlg. 2 Link, NW SE 17-19-9w, dry, T.D. 3,290 ft.

Deichman, Cowley County: Trees Oil 1 Gibson, SE SW NW 24-31-4, pumped 86 bbl., Bartlesville 2,841-70 ft., T.D. 2,960 ft.

Frog Hollow, Cowley County: Phillips 4 Lena, SW SE SE 17-32-5, pumped and flowed 338 bbl., Bartlesville 3,036-58 ft.

Geneseo, Rice County: Continental 4-A Hamilton, SW SE NW 19-18-7w, 1,051 bbl. potential, Arbuckle 3,198-3,232 ft.

Hall-Gurney, Russell County: M. E. Trapp 2 Gross, N½ NE NW 5-15-13w, pumped 351 bbl., Lansing 2,911-40 ft.

Keesling, Rice County: Herndon Drlg. 2 McGlynn, E½ NE SW 4-20-9w, pumped 203 bbl., Arbuckle 3,234-44 ft.

R. Olsen et al 1 English, E½ NW NW 22-20-9w, dry, T.D. 3,248 ft.

Luther Mackall 2 Peterson, E½ SE NW 4-20-9w, dry, T.D. 3,267 ft.

Kraft-Prusa, Barton County: Derby Oil 5 Esfeld, NE NE NW 29-16-11w, swabbed 193 bbl. in 4 hr., Arbuckle 3,287-96 ft.

Max, Stafford County: Stanolind 4 Helmers, W½ SE NW 1-22-12w, swabbed 15 bbl. an hr., potential 583 bbl., Arbuckle 3,560-67 ft.

McLouth, Jefferson County: Hatcher & Fisk 1 Woodhead, SW SW 29-9-20, pumped 32 bbl., Bartlesville 1,479-1,520 ft.

Hatcher & Fisk 1 Edmonds, NW NW 21-9-20, 3,500,000 cu. ft. gas, sand 1,391-1,400 ft.

McLouth, Leavenworth County: McLaughlin 1 Edmonds, SW SW 15-9-20, dry, T.D. 1,531 ft.

Peace Creek, Reno County: Cities Service 3 Heylmun, SW NE 15-23-10w, potential 3,000 bbl., flowed 48 bbl. in 2 hr., Viola 3,790-96 ft.

Cities Service 3-C Kreie, SW SW SE 21-23-10w, potential 3,000 bbl., Viola 3,784-90 ft.

Cities Service 4 Snowbarger, NE NW 22-23-10w, potential 3,000 bbl., Viola 3,780-88 ft., T.D. 3,819 ft.

Peace Creek, Northeast, Reno County: Cities Service 1-B Hinshaw, SW SE NE 11-23-10w, potential 3,000 bbl., flowed 240 bbl., Viola 3,749-60 ft.

Ray, Norton County: Cities Service 1 Kitzke, NE NE SE 36-5-21w, potential 780 bbl., pumped 12 bbl. an hr. for 12 hr., Lamotte sand 3,600-06 ft.

Ray, Phillips County: Cities Service 7-A Pinkerton, SW NE NE 31-5-20w, potential 2,500 bbl., Lamotte sand 3,620-26 ft.

Schweizer, Reno County: Hinkle Oil 2 Schweizer, SE SW NW 31-22-9w, flowed 13 bbl. an hr., acidized, est. pump 455 bbl. per day, Viola 3,718-23 ft.

Silica, Barton County: Crown Pet. et al 3 Scheufler, E½ SW NW 18-20-11w, dry, T.D. 3,381 ft.

Stickney, Barton County: Darby Pet. 2 Susank, SE NE SE 19-16-13w, 3,000 bbl., Arbuckle 3,381-88 ft.

Zenith, Reno County: Magnolia 1 Sauer, E½ NW NE 18-24-10w, dry, T.D. 3,873 ft.

NEBRASKA

ST. JOSEPH, Mo.—Power Oil Co. made arrangements the past week to install a pump at its 1 D. E. Bohrer in the Dawson pool of Richardson County, E½ SW NW 10-1n-14e, after announcing that the well had started to produce from the Viola lime. Drilled last March, the well filled with oil from the Viola, topped at 2,922 ft., but water broke in from above and the company has been until the past week repairing the trouble. Operators said they swabbed oil at the rate of 360 bbl. per day, with comparatively little water. If all goes well this will be the first Viola producer for Nebraska.

Skelly Oil Co., which had temporarily abandoned 1 Wiltse in the Dawson pool, E½ NW SE 10-1n-14e, following Viola, Wilcox and Simpson failures, was preparing to test the Hunton lime.

(Continued on Page 82)

Illinois Fields

(Continued from Page 72)

2,614 ft., Cypress 2,635 ft., Weiler 2,665 ft., Aux Vases 2,952 ft., Ste. Genevieve 2,975 ft., Rosiclare 2,985 ft., Fredonia 3,003 ft., McClosky 3,009 ft.

St. Clair County: Emil Burgard 1 R. W. Mumme, SW SW SW 4-2s-6w, dry at 928 ft., McClosky 886 ft.

Wayne County: W. E. Huff et al 1 Farris, N½ SE NW 34-1n-8e, dry at 3,281 ft., Menard 2,304 ft., Vienna 2,397 ft., Tar Springs 2,418 ft., Glen Dean 2,519 ft., Golconda 2,604 ft., Barlow 2,689 ft., Cypress 2,708 ft., Paint Creek 2,919 ft., Renault 2,961 ft., Aux Vases 2,975 ft., Ste. Genevieve 3,035 ft., Rosiclare 3,048 ft., Fredonia 3,066 ft., McClosky 3,091 ft.

Texas 1 F. Talbert, SE NW 29-1s-6e, pumped 49 bbl., 1,000 gal. acid, reacidized 3,000 gal., McClosky 3,148-56 ft., 3,160-67 ft., 3,175-78 ft., T.D. 3,184 ft., P.B. 3,172 ft., *extends Sims pool ½ mile west.*

White County: Seaboard et al 1 Calvert, N½ NW NE 33-6s-10e, dry at 3,069 ft., Kincaid 1,814 ft., Menard 2,002 ft., Vienna 2,304 ft., Tar Springs 2,318 ft., Glen Dean 2,365 ft., Golconda 2,478 ft., Barlow 2,600 ft., Cypress 2,620 ft., Renault 2,820 ft., Ste. Genevieve 2,932 ft.

Fields

Bible Grove, Clay County: Pure 1 L. Zander, NW NW SE 8-5n-7e, dry at 2,907 ft., Tar Springs 2,251 ft., Glen Dean 2,325 ft., shale 2,340 ft., Hardinsburg 2,357 ft., Barlow 2,488 ft., Cypress 2,501 ft., Paint Creek 2,650 ft., Benoist 2,669 ft., Renault 2,712 ft., Aux Vases 2,732 ft., Ste. Genevieve 2,792 ft.

Bone Gap, Edwards County: R. Congden 1 Hocking, W½ NE SW 7-1s-11e, pumped 112 bbl., natural, McClosky 3,223-32 ft., T.D. 3,232 ft.

Boulder, Clinton County: Texas 1-C Murphy, NE NW NE 2-2n-2w, pumped 299 bbl., Benoist 1,193-1,204 ft., T.D. 1,221 ft.

Dale, Hamilton County: Shell-Pure 1-A Daily, SE NW 12-6s-6e, pumped 124 bbl. oil and 10 bbl. water, 20-qt. shot 2,040-53 ft., Aux Vases 3,023 ft., T.D. 3,065 ft.

Shell 10 W. W. Daly, NW NE 12-6s-6e, pumped 81 bbl., 25-qt. shot 3,027-44 ft., 20-qt. shot 3,020-34 ft., Benoist 2,907-23 ft., Aux Vases 3,008-20 ft., 3,033-41 ft., T.D. 3,056 ft., P.B. 2,923 ft.

Texas 1 V. H. Miller, NW NE SW 8-6s-7e, dry at 3,075 ft., Menard 2,206 ft., Glen Dean 2,435 ft., Hardinsburg 2,560 ft., Golconda 2,575 ft., Barlow 2,702 ft., Cypress 2,742 ft., Weiler 2,789 ft., Benoist 2,930 ft., Renault 2,944 ft., Aux Vases 3,007 ft.

Pure 1-A H. Phillips, NW NW NW 6-6s-7e, pumped 417 bbl., 100-qt. shot 3,013-30 ft., Aux Vases 3,012-30 ft., T.D. 3,030 ft.

Dundas, Jasper County: Standard Drlg. 1 Poehler, E½ NE NW 7-5n-10e, pumped 104 bbl., 5,000 gal. acid, McClosky 2,849-54 ft., T.D. 2,872 ft., P.B. 2,861 ft.

Pure 1 Sproul, E½ SE SE 18-5n-10e, pumped 159 bbl. oil and 228 bbl. water, Cypress sand 2,515-26 ft., T.D. 2,536 ft.

East Centerville, White County: Skelly 1-B P. L. Barbie, NW NE 18-4s-10e, pumped 255 bbl., 30-qt. shot 2,496-2,512 ft., 10-qt. shot 2,477-82 ft., Tar Springs 2,494-2,513 ft., T.D. 3,224 ft., P.B. 2,525 ft.

East Centralia, Marion County: Lewis Lilly 2 Leonard, SE SE NE 17-1n-1e, pumped 70 bbl., 15-qt. shot 1,650-65 ft., Weiler 1,648 ft., T.D. 1,667 ft.

Griffin, Wabash County: Longhorn 27 Helm, SE SW NE 22-3s-14w, pumped 250 bbl., 40-qt. shot 2,505-17 ft., 60-qt. shot 2,643-58 ft., Cypress 2,498-2,519 ft., Benoist 2,641-58 ft., T.D. 2,792 ft., P.B. 2,660 ft.

Parkersburg, Edwards County: Magnolia 1 Brake, NE SW 31-2n-14w, pumped 47 bbl., perf. 3,161-64 ft., 25-qt. shot 2,955-70 ft., Paint Creek sand 2,953 ft., T.D. 3,240 ft., P.B. 2,970 ft., cleaned out to 2,985 ft.

Roland, White County: Carter 1 J. M. Allen, NW SW 15-7s-8e, pumped 124 bbl., 17-qt. shot 2,169-70 ft., Waltersburg 2,164 ft., T.D. 2,175 ft.

Rural Hill, Hamilton County: Shell 1 Ohio Bureau of Credits, SE SE NW 14-6s-5e, pumped 12 bbl. oil and 1 bbl. water, 2,000 gal. acid, reacidized 1,500 gal., McClosky 3,314-30 ft., T.D. 3,416 ft., P.B. 3,279 ft.

Shipman, Macoupin County: W. R. Holmes 1 G. Kulemkamp, NW SE SW 7-8n-8w, 500,000 cu. ft. gas, T.D. 320 ft.

Sims, Wayne County: Texas 1 W. Thomas estate, W½ SE NW 27-1s-6e, pumped 573 bbl., 2,000 gal. acid, McClosky 3,163-73 ft., 3,182-92 ft., T.D. 3,194 ft.

Texas 1 T. E. Richards, SE SE 29-1s-6e, dry at 3,175 ft., Menard 2,288 ft., Glen Dean 2,515 ft., Golconda 2,614 ft., Barlow 2,716 ft., Cypress 2,784 ft., Benoist 2,896 ft., Renault 2,922 ft., Aux Vases 3,012 ft., Ste. Genevieve 3,054 ft., Rosiclare 3,078 ft., Fredonia 3,130 ft., McClosky 3,138 ft.

Woburn, Bond County: Hudson et al 1 Hughey, NE SW SW 10-6n-2w, dry at 1,301 ft., Cypress 855 ft., Paint Creek 878 ft., Benoist 1,025 ft., Renault 1,045 ft., Aux Vases 1,062 ft., Ste. Genevieve 1,100 ft., Rosiclare 1,120 ft., Fredonia 1,125 ft.

Woodlawn, Jefferson County: Shell 1 Schmidt, NW NW SE 25-2s-1e, dry at 2,366 ft., Menard 1,392 ft., Tar Springs sand 1,509 ft., Glen Dean 1,613 ft., Golconda 1,727 ft., Cypress 1,836 ft., Weiler 1,840 ft., Benoist 2,012 ft., Aux Vases 2,082 ft., Ste. Genevieve 2,170 ft., Rosiclare 2,179 ft.

Posey County Wildcats Report Levias and Cypress Production

EVANSVILLE, Ind.—Jarvis Brothers et al 1 Sander, SW SE NW 26-6s-13w, a wildcat about ¾ mile west of the South Bufkin field, was drilled in last week and on initial tests swabbed at the rate of 8 bbl. of oil an hour natural from the Levias lime (formerly reported as McClosky) at 2,733-43 ft. No. 1 Sander is in Posey County about 2½ miles northeast of Mount Vernon.

Another Posey County wildcat was scheduled to be drilled in last week. It is the Gulf Refining Co. 1 Lynn Starack, NE NE 30-6s-13w, north of Mount Vernon, where casing has been set to Cypress sand saturation at 2,515 ft. No. 1 Starack was drilled to a total depth of 3,028 ft. in the St. Louis lime but was plugged back to 2,585 ft. to test the Cypress saturation. A showing of oil was also reported in the McClosky lime at 2,807-10 ft.

Rotary tools have been rigged up at Lindas 1 Ruby Spencer, SW SW 13-7s-13w, Posey County. The test has been shut down for several days at a total depth of 1,151 ft.

INDIANA COMPLETIONS

Gibson County: Charles Beck 1 Sheets, NW NW Don. 95-1n-10w, dry, T.D. 1,870 ft., Ste. Genevieve 1,790 ft., McClosky 1,814-17 ft.

Kingwood Oil 1 Robertson, Don. 110-1n-10w, pumped 120 bbl., Ste. Genevieve 1,798 ft., McClosky 1,817-25 ft., T.D. 1,832 ft.

Schneider & Gwinn 1 Crecilius, NW SE 36-1s-10w, pumped 75 bbl., pay 1,312 ft., T.D. 1,333 ft.

Jay County: N. N. Smith et al 1 Schaffer, W½ NW NW 22-22n-15e, dry, T.D. 1,213 ft.

Grissell & Kwis 1 Yoder, SW SE SW 13-23n-13e, gas well, T.D. 994 ft.

Posey County: Paul Rossi 1 Lewis-Thomas, SE SW 5-7s-12w, dry, T.D. 2,634 ft.

Pulaski County: Frank Lyons 1 Fuff, NW NW SW 24-29n-2w, dry, T.D. 950 ft.

Randolph County: Unionport Oil & Gas Corp. 1 Johnson, SW NE NW 9-19n-13e, 25,000,000 cu. ft. gas, Trenton 1,038 ft., T.D. 1,078 ft.

OHIO

ZANESVILLE, Ohio.—Gas wells make up the majority of Ohio completions topped by a 3,200,000-cu. ft. well in Wayne County. The Clayton pool in Perry County yielded another fair producer, flowing 112 bbl. the first 24 hours after shot.

An Anthens County test found the Clinton sand dry.

OHIO COMPLETIONS

Athens County, Rome Township: Gibson et al 3 William Copeland, Sec. 29, 180,000 cu. ft. gas, Macksburg 800-ft. sand, T.D. 816 ft.

Ohio Fuel 1 S. J. Parker, Sec. 34, dry, second Berea, T.D. 1,670 ft.

Trimble Township: Preston Oil 208 Sunday Creek Coal Co., Sec. 33, dry, Clinton 3,558-75 ft., T.D. 3,668 ft.

Lodi Township: Ross, Welmer & Ross 2 Pearl Sapp, Sec. 13 at Pratts Fork, 4 bbl., Mitchell sand, T.D. 380 ft.

Coshocton County, Perry Township: Blackburn et al 3 Charles Oxley, Sec. 24, 130,000 cu. ft. gas, Clinton 3,092-3,138 ft., T.D. 3,140 ft.

Hocking County, Ward Township: Kachelmacher Estate 1 L. D. Poston, Sec. 26, 300,000 cu. ft. gas, Injun, T.D. 433 ft.

Knox County, Brown Township: James Upham 1 J. C. Gaines, Sec. 22, 25,000 cu. ft. gas, Clinton 2,800-42 ft., T.D. 2,870 ft.

Lorain County, Ridgeville Township: Edson & Son 1 Jacob Sorger, Lot 41, 900,000 cu. ft. gas, shot, Clinton, T.D. 2,380 ft.

Meigs County, Rutland Township: Fugate et al 2 J. Miller, Sec. 32, 320,000 cu. ft. gas, stray and Maxon sand, T.D. 747 ft.

Ohio Fuel 1 Violet Brown, Fraction 24, dry, Injun (water), T.D. 975 ft.

Morgan County, York Township: Swingle et al 1 Carl Weaver, Sec. 36, 200,000 cu. ft. gas, shot, Berea 1,086-1,106 ft., T.D. 1,108 ft.

Muskingum County, Blue Rock Township: Industrial Gas Corp. 1 R. M. Gander, Sec. 4, 680,000 cu. ft. gas, Clinton shell at 4,270 ft., Clinton 4,299-4,339 ft., dry, T.D. 4,340 ft.

Newton Township: Industrial Gas 1 H. Jenkins, Sec. 7, dry, Clinton, T.D. 3,508 ft.

Muskingum Township: Ohio Fuel Gas Co. 1 Roy Gallogly, Sec. 11, 25,000 cu. ft. gas only, Clinton sand, T.D. 3,720 ft.

Perry County, Clayton Township: Preston Oil 1 Jacob Keffer, Sec. 9, flowed 112 bbl., shot, Clinton 3,298-3,343 ft., T.D. 3,349 ft.

Preston Oil Co. 2 Corynne Wagner et al, NW Sec. 4, 149 bbl. and 50,000 cu. ft. gas, Clinton sand, T.D. 3,339 ft.

Pure Oil Co. 5 B. J. Williams, SE Sec. 7, 128 bbl. and 50,000 cu. ft. gas, Clinton sand, T.D. 3,255 ft.

Thorn Township: Ohio Fuel 1 John E. Stimmel, Sec. 27, 190,000 cu. ft. gas, Berea 800-04 ft.

Industrial Gas Corp. 1 Mary Cooperrider, NE Sec. 13, 15 bbl., Clinton sand, T.D. 2,820 ft., swabbed oil.

Summit County, Boston Township: William Dempsey 1 T. S. Prusak, Sec. 2, 1,500,000 cu. ft. gas, shot, Newburg, T.D. 2,928 ft.

Stark County, Pike Township: Belden et al 2 Barber Co., Sec. 10, 1,800,000 cu. ft. gas, shot, Clinton, T.D. 4,736 ft.

Tuscarawas County, Fairfield Township: Brendel Prod. Co. 2 E. E. Dessecker, Sec. 15, 800,000 cu. ft. gas, shot, Clinton, T.D. 5,068 ft.

Wayne County, Plain Township: Mehowa O. & G. 2 George Rickabaugh, Sec. 28, 3,260,000 cu. ft. gas, Clinton, T.D. 3,181 ft.

EASTERN KENTUCKY

ASHLAND, Ky.—Gas production was sharply increased this week as four wells were drilled in

(Continued on Page 78)

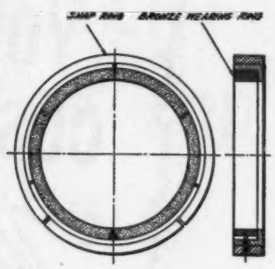
IT'S STRANGE but true that comparatively insignificant things can monkey-wrench the best of plans and equipment.

Packing is one of those "tremendous trifles". Its cost is small. The best packings cost almost nothing compared with the engine or compressor, very little compared with the cost of delays, breakdowns, scored rods or cylinders.

France does its level best to turn out the finest packings skilled hands, good materials and up-to-the-minute machinery can produce. It makes metallic packings for usual conditions but is perhaps better known for its work in developing special packings, such as those used for safely handling corrosive, deadly or inflammable gases for vacuums or pressures up to 15,000 lbs.

Like others, we are working day and night on war orders, but the next time you have a packing problem, whether it is conventional or unusual, we might be able to help you solve it.

PACKINGRAM by E. A. FRANCE



SHEATHED BRONZE FIRE CHECK

Packings used in double-acting Gas Engines require Fire Checks to retard the intense heat and sudden rise in pressure. These special rings work under the most adverse conditions of heat, temperature and poor lubrication.

Bronze of the proper characteristics withstands the abuses of poor lubrication and will not readily score or wear the rod. Its most important advantage over iron is rapid heat conduction. A protecting sheath of cast iron over one face and outside diameter of the bronze ring protects the bronze from direct contact with the burning gases; absorbs heat only 1/9 as fast as the bronze behind it, and covers the open joints of the ring segments. It is far more effective than two independent rings in one groove.

Ring segments are held in contact with the rod by a heat-resisting cast iron contracting spring. The spring ring can be snapped over the diameter of the piston rod allowing the entire unit to be assembled without disconnecting the rod.

France Sheathed Bronze Fire Check Rings show no side wear and no rod wear. None has ever worn out. They may be obtained for installation in existing packing cases.

Complete line of packing for all gases up to 15,000 lbs. pressure, as well as for superheated steam engines and gas engines.

FRANCE MFG. CO.

FRANCE MANUFACTURING COMPANY

Belgrade and Orthodox Streets • Philadelphia, Penna.

"Don't Take A Chance—Take FRANCE"

Deep Sparta Sand Shows On Flank of Pine Prairie Dome

By F. L. SINGLETON

NEW ORLEANS, La.—A new producing area is anticipated for the Pine Prairie dome, Evangeline Parish, as Texas Co. prepared to test 2-B Le Danios Land & Stone Co., located on the southwest flank of 35-3s-1w. Clean sand showing oil was cored in a sidetracked hole at 9,462-74 ft., and sandy shale and sand showing oil was cored at 9,474-93 ft. Total depth is 9,494 ft., and casing was being cemented after running an electrical survey and cutting side-wall cores. This is the second test to be drilled by the company in this area being located a few hundred feet from a dry hole located on the same tract. The sand section has been identified as the Sparta, and is several hundred feet deeper than that which was found the past year on the east flank at 7,600 ft. and 8,200-8,300 ft.

Danciger Oil & Refining Co. et al were preparing to retest 1 Dendinger, Inc., a wildcat located in the Tickfaw area, Livingston Parish. This well was drilled to a total depth of 10,447 ft. where it encountered heaving shale, and 7-in. casing was cemented at approximately 7,500 ft., preparatory to testing four or five sands in the Marginulina formation which carried an oil odor when cored. However, an electrical survey is reported to have shown little resistivity and possibilities of production are not considered encouraging. The first test made at 7,264-70 ft., recovered 3,494 ft. of salt water with no showing, and additional tests are expected to be made at intervals from 7,400-7,500 ft. This is one of the few deep tests drilled in the parish which is void of any production. In view of the fact that sufficient showings were logged to cement casing indicates the presence of structure and additional development in the area is expected.

YOURS FOR LOW-COST PRODUCTION
Union-Formed Wire Rope
Because Union-Formed (pre-formed) Wire Rope is free from internal stress, it is much slower to fatigue under the combined stresses of constant bending. In service over small sheaves or wherever bending is severe, Union-Formed will far outlast ordinary rope and effect a real money saving. Write or wire.
UNION WIRE ROPE CORPORATION
2102 Manchester Ave. Kansas City, Mo.
Tulsa • Houston • Chicago • Salt Lake City
New Orleans • Monahans • Portland • Ashland, Ky.
UNION Wire Ropes
The "ULTIMATE LOW COST WIRE ROPE"
WRITE FOR ROPE DOPE
This periodical bulletin of wire rope facts will be sent you without charge.
E-42

Mechanical Trouble Halts Testing Of Deep Sands in Westwego Field

In the Westwego field, Jefferson Parish, Titanic 2 Marrero Land & Improvement Co. was tested through perforated casing at 9,005-08 ft., and the well flowed at the rate of 10 bbl. of fluid per hour, of which 80 per cent was oil and 20 per cent salt water. The well has been killed and retesting in the same section is expected. This well was drilled to a total depth of 11,509 ft., and an electrical survey showed possible production in deeper sands, but a successful test was never made due to mechanical trouble.

Two deep tests located in Terrebonne Parish which are generally looked upon as prospective pool openers continued to drill ahead and no further showings of oil or gas have been reported. In the Jug Lake area, Superior 1 La Terre, 27-19s-15e, is drilling in shale below 12,100 ft., while Humble 2 Continental Land & Fur Co., in the Casteel area, is drilling below 10,400 ft. Showings of oil and gas were logged in both wells at 11 intervals from 9,500 ft. to 10,250 ft.

Following the completion of Pure 2 Vermilion Irrigation Co. which opened production from a deeper pay in the West Gueydan field, Vermilion Parish, Magnolia Petroleum Co. announced location for 5 J. B. Ferguson, about ¼ mile from the deep sand discovery.

Another producer was added to the south flank of the Starks field, Calcasieu Parish, with the completion of W. T. Burton 6 Industrial Lumber Co., which is flowing at the rate of 231 bbl. daily through a ¼-in. choke from perforation opposite sand at 3,914-34 ft. In the meantime the same operator was moving a rig to the north flank for 6 Lutcher-Moore.

Attempted Extension at Lafitte Fails

An attempt to extend production in the prolific Lafitte field, Jefferson Parish, failed when Texas 1 Rojas, about 1 mile east of the field, was abandoned as a dry hole at a depth below 10,500 ft. This is one of the few dry holes that have been drilled on the structure which produces from several thick sand sections at intervals from 8,900-10,300 ft.

After testing salt water with some gas and distillate, Stanolind Oil & Gas Co. 1 Dohmann, an outpost located in the Lewisburg area, St. Landry Parish, was being plugged back for a series of tests in a shallow sand logged by an electrical survey from 9,090-9,105 ft. This sand is approximately 1,200 ft. higher than the main sand at 10,200-10,300 ft. while little information has been released the well is thought to be located on a separate structure.

In the Paradis field, St. Charles Parish, Humble

(Continued on Page 84)

Wilcox Production Found in Livingston Field, Polk County

By F. L. SINGLETON

HOUSTON, Tex.—The Livingston field, Polk County, a Cockfield sand discovery of 1932, was being added to the list of older fields in which deeper exploration has opened Wilcox sand production. The latest discovery was made by Jordan Drilling Co. 1 I. B. Munson, located near the heart of the field which is preparing to drill deeper following a drill-stem test in the upper Wilcox sand that recovered 1,600 ft. of 35-gravity oil and tested 10 lb. working pressure. Coring was started just below 6,900 ft., and from 7,017-22 ft., sand with a good cut and odor was recovered. Sandy shale with a faint gas odor was cored from 7,022-27 ft., and from 7,035-47 ft., 7 ft. of fairly porous sand was recovered. The drill-stem test lasted 14 minutes and was made from 7,036-47 ft., total depth.

The well is located in the A. Viesca Survey, about 2,000 ft. southwest of the discovery well, which opened production from both the upper and lower Cockfield formation from approximately 4,100-4,300 ft. This is the first deep Wilcox test to be drilled on the structure although the possibilities of such production has been anticipated since the opening of Eocene production in the Joe's Lake area in 1937. It is interesting to note that Livingston is the fifth Cockfield sand type of field in which Wilcox production has been opened and it encourages deeper exploration in other proven fields including the immense Conroe field, Montgomery County, although one exploratory test failed to find production.

Leases in the Livingston field are held by various companies and the discovery during normal times would lead to considerable drilling. Woodley Petroleum Co. and Kirby Petroleum Co. recently purchased an undivided one-fourth interest in the Munson well and the 40-acre well site. The well is also being supported by the Humble Oil & Refining Co. which agreed to pay $2,500 bottom-hole money after the well had reached a depth of 8,500 ft.

Third Test in New Mercy Field Indicates Large Producing Area

While the above well apparently assured another Wilcox sand pool for the district some idea as to the potentiality of the new Mercy field, San Jacinto County, was revealed as 7-in. casing was cemented on bottom at 8,311 ft. in Atlantic 1 Palmer, about 1 mile north of the discovery well. Sand and shale with a good oil odor was cored at 8,253-63 ft., sandy shale from 8,263-73 ft., 8,273-86 ft., no recovery, 8,286-91 ft., recovered 4 ft. of oil sand 8,291-8,301 ft., recovered 1 ft. porous sand while from 8,301-11 ft., the total depth, 8 ft. of sand was recovered of which the top 4 ft. carried oil and the bottom salt water, which apparenly established the water table for the structure. Using 8,253 ft. as the top of the Wilcox, the well is about normal with the discovery well. Upper geological markers released by the company are as follows: Cockfield 4,894 ft., Discorbis Yeguaensis 4,977 ft., Eponides Yeguaensis 5,682 ft., Ceratobulimina 6,544 ft., and the Operculina at 6,664 ft. This will be the third producer for the structure, all of which have logged the sand about normal with each other, indicating a producing area of considerable size.

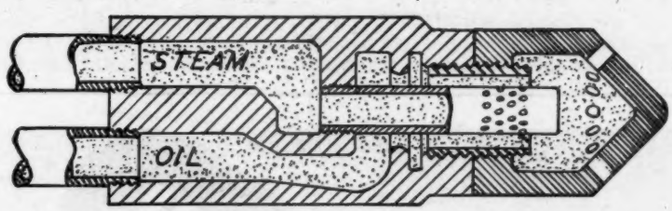
Reports from the Cistern area in Fayette County, where Continental Oil Co. is attempting to open shallow Wilcox production, were more encouraging as retesting of 1 Gabitsch recovered pipe-line oil. Drill-stem testing through perforated casing at 2,867-73 ft. recovered 630 ft. of oil, 180 ft. of oily mud and 991 ft. of fresh water. At the end of the week the perforations were being squeezed off and another test was expected to be made in the same sand section. Drill-stem testing the previous week at 2,808-23 ft. tested 405 lb. working pressure while additional tests at intervals from 1,900-2,220 ft. recovered fresh water.

Test on Millican Dome Completed as Gas Well

Along this same trend and located on the Millican dome, Brazos County, Phillips 1 Jericho is reported to have been completed for a gas well with 1,500 lb. shut-in working pressure on the tubing, and the large rig used in drilling has been moved from the area. Total depth of the well is 3,559 ft., but details as to where the well was

(Continued on Page 83)

"Burn Gasoline in an OIL BURNER?" Sure, John Zink can, with the M T OIL BURNER



The John Zink Series M T Impinging Type Oil Burners will satisfactorily burn low octane straight-run gasoline and naphtha. As these two products require very costly processing to make them salable — it is often more advantageous to burn them for fuel, and to market the additional plant fuel oil production, that ordinarily would be consumed in the refinery to produce heat for process.

The Series M T Oil Burner features a multiple tangentially drilled nozzle — provides equal distribution of fuel to all burner tip ports.

Write for Descriptive Bulletin and Prices—

JOHN ZINK COMPANY
TULSA, OKLAHOMA

New York • Houston • Los Angeles

SOUTHWEST TEXAS

De Witt and Wilson County Tests Show in Wilcox

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—Wilcox sand development continued to highlight operations in the Southwest Texas district, as another wildcat located in De Witt County was placed on the list of prospective pool openers. The prospective discovery is Tide Water et al 1 Gips about 10 miles southwest of the town of Yorktown in the W. A. Moore Survey. Sand with a gas odor was cored at 7,000-23 ft., sandy shale from 7,023-25 ft., and sand from 7,025-39 ft., showed from 2 to 3 per cent saturation. A drill-stem test in this section is reported to have recovered 20 ft. of 38-gravity oil and 1,700 ft. of salt water and the well is coring ahead in sand below 7,039 ft. This particular sector of the trend has received a widespread leasing and geophysical play as the result of recent developments which have opened two fields, Yorktown and Thomaston, both of which are on strike with the present test. In view of the fact that geological markers on the Gips test are no available not correlation can be made at this time.

Wilson County Test May Open New Wilcox Pool

Although still in the testing stage, Holland Oil Co. 1 Boysen, 5 miles northeast of the town of Poth, Wilson County, was showing promise of opening commercial Wilcox sand production. After testing 30 ft. of mud-cut oil on a production test at 4,152-57 ft., the perforations were squeezed off and the casing was reperforated at 4,082-87 ft., and 4,091-96 ft. On a 11-hour drill-stem test, the well started flowing oily mud in 5½ hours and flowed at the rate of 3 bbl. of oily mud in the last 5½ hours that the tool was opened. Working pressure varied from 0-13 lb. on top and bottom-hole flowing pressure registered 1,600 lb. After testing tool was closed, 270 ft. of oily mud and 1,890 ft. of oil and 2,070 ft. of water with a brackish taste was recovered. The water is believed to have come from the upper part of the sand, and perforations were being squeezed off.

Humble 1 King located in Kleberg County and about 3,900 ft. northeast of the Seeligson field, Jim Wells County, was preparing to drill ahead after apparently establishing the water level in a thick sand section several hundred feet shallower than the first sand found in the field proper at approximately 5,200 ft. This well was reported the previous week as topping sand showing oil and gas at 4,640 ft., and with the exception of a few thin shale breaks, the section was logged practically solid to 4,684 ft. In addition to the drill-stem tests already reported, testing at 4,674-84 ft., recovered 650 ft. of oil while a 30-minute drill-stem test at 4,687-4,703 ft. tested no working pressure and recovered 460 ft. of salt water. The well is located on the huge King ranch all of which is under lease to the Humble Oil & Refining Co.

Wildcat Activity

Sun 2-A Frost National Bank, 1½ miles south of the Rincon field, Starr County, was placed on the pump and a late gage showed the well pumping at the rate of 32 bbl. of oil and 1 bbl. of salt water daily. Total depth is 5,435 ft., with production from sand opposite perforations at 4,181-83 ft., and 4,187-91 ft. In the meantime, the same company's 1-A Montalvo, 3 miles north of the Sun field, Starr County, was being rigged up to pump after it failed to flow from sand at 6,090-6,131 ft. Otto Woods 1-A Bass, 5 miles east of the Rio Grande, perforated casing at 1,964-67 ft., and the hole was being swabbed.

In Webb County, and located 1½ miles southwest of the Moca field, Magnolia Petroleum Co. was rigging up pumping equipment at 1 Duval County Ranch Co. With the hole bottomed at 2,638 ft., and 7-in. casing cemented at 2,022 ft., perforations were made at 1,957-58 ft., where a test recovered 55 ft. of drilling mud with a show of oil. Additional perforations were made at 1,962-68 ft., and 50 ft. of mud with an oil show was recovered. The well is expected to be completed for a small pumper.

SOUTHWEST TEXAS COMPLETIONS
LOWER GULF COAST DISTRICT

Wildcats

Aransas County: Southern Minerals 1 Bankers Mortgage, dry, T.D. 7,510 ft.
Refugio County: D. S. Hogan 1 Kelly, dry, T.D. 6,110 ft.

Fields

East Placedo, Victoria County: Barnsdall 1 Marek, 92 bbl., ⅛-in. choke, perf. casing 5,536-40 ft., T.D. 6,883 ft.
Moran Oil Co. 2 Mitchell, 84 bbl., 3/32-in. choke. perf. casing 6,379-83 ft., T.D. 6,902 ft.
McFaddin, Refugio County: P. R. Rutherford 8-C Fagan, dry, T.D. 5,699 ft.
Refugio, Refugio County: Hewitt & Dougherty 1 Fox & Heard, 9 bbl. open flow, perf. casing 6,218-45 ft., T.D. 6,410 ft.
Hewitt & Dougherty 1-B Reilly, 100 bbl., ⅛-in. choke, perf. casing 5,665-73 ft., T.D. 6,280 ft.
Sunray 6 Mitchell, 240 bbl. distillate, ¼-in. choke, perf. casing 8,430-45 ft., T.D. 9,373 ft.
Seeligson, Jim Wells County: Shell 8 Seeligson, 139 bbl., 9/67-in. choke, perf. casing 5,934-45 ft., T.D. 6,043 ft.
South Caesar, Bee County: Atlantic 2 Grissom, top Wilcox 6,554 ft., dry, T.D. 6,840 ft.

LAREDO DISTRICT

Wildcats

Duval County: Guy Warren 3 Driscoll, dry, T.D. 3,925 ft.
Jim Hogg County: Sal Vieja Oil Co. 1 Cuellar, dry, T.D. 3,210 ft.
Live Oak County: Humphries & Hotchkins 2 Wade, dry, T.D. 2,376 ft.

Fields

Alamo, Hidalgo County: McCollum & Lockhart 1 Sweeney, 168 bbl. distillate 20 hr., $\frac{7}{32}$-in. choke, perf. casing 5,505-10 ft., 5,933-58 ft., T.D. 6,557 ft.
Colorado, Jim Hogg County: Humble 69-B King, 148 bbl., $\frac{7}{32}$-in. choke, T.D. 3,116 ft.
Sun 1-C East, 90 bbl. 12 hr., $\frac{7}{32}$-in. choke, T.D. 3,022 ft.
Yturria, Starr County: Sun 1-B Garcia, temporarily abandoned, T.D. 4,329 ft.

SAN ANTONIO DISTRICT

Wildcats

Lee County: Furlow & Trash 1 Peebles, dry, T.D. 2,100 ft.
Williamson County: H. C. Albert 1 Stromberg, dry, T.D. 875 ft.
H. Plath 1 Boertz, dry, T.D. 1,268 ft.

Fields

Chicon Lake, Medina County: Charles Wagner 7-C Medina Irrigation Co., dry, T.D. 660 ft.

Eastern Kentucky

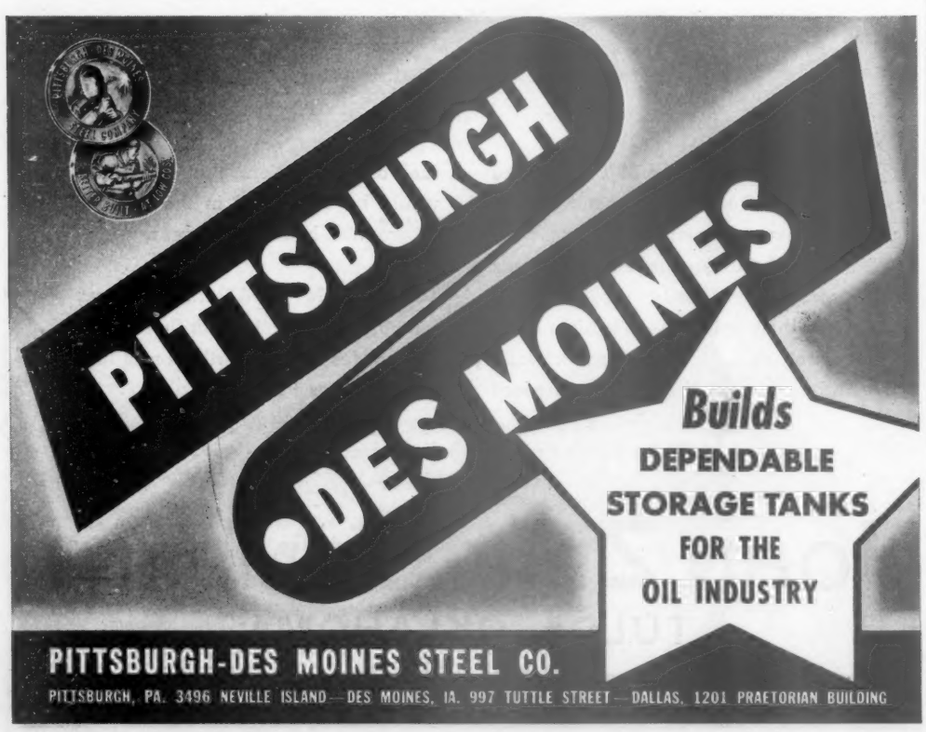
(Continued from Page 75)

with two of them excellent producers. A number of new locations have been made and drilling seems to have taken an upturn in some districts, especially in the gas fields. Only a very few oil wells have been reported in recent months, however, and thus most attention has been focused on the gas area.

The federal spacing order seems to have slowed some wildcat inclinations and the current drilling is along definite programs.

The Kentucky-West Virginia Gas Co. reported the completion of the four productive wells this week, which have a combined open flow of 5,005,000 cu. ft. of gas daily.

Floyd County: No. 683 Jane Nunnery, Johns Creek, 2,500,000 cu. ft., Big lime, T.D. 1,472 ft.
Knott County: No. 5390 John M. Bailey, Caney Fork. 133,000 cu. ft., brown shale, T.D. 2,840 ft.
Pike County: No. 686 Collinsworth, Johns Creek, 158,000 cu. ft., shot, T.D. 2,820 ft. in shale.
No. 5395 A. J. May, Robinson Creek, 2,214,000 cu. ft., T.D. 3,300 ft. in shale.



Hunton Discovery Reported South of Brooksville

By CARL HOOT

COMPLETED wells reported last week in Oklahoma were probably at an all-time low with three wells in active pools, seven miscellaneous, five recompletions and five wildcats. Of the five wildcat tests, four were dry and the remainder produced 4,000,000 cu. ft. of gas daily and was classed as a discovery. It was Phillips 1 Checotah, SE SW 16-11-17, McIntosh County, producing from the Wilcox at 1,522-32 ft.

Pottawatomie County

Though completions for the week were down, several wildcat tests are showing for pool openers. Among these is Atlantic Refining Co. 1 Hamil, NE SW 27-8-3, Pottawatomie County, some 4 miles south of the Brooksville pool and northwest of the Romulus pool. On a drill-stem test at 4,640-4,829 ft., opened 1 hour, gas flowed in 10 minutes, followed by an estimated 100 bbl. of oil an hour. Operators were preparing to deepen to the second Wilcox before making further tests. Tops logged were Mayes 4,480 ft., Woodford 4,490 ft., Hunton 4,598 ft., Sylvan 4,804 ft., and Viola lime 4,905 ft. It is about 1 mile northeast of Smith Brothers 1 Fundis, SW NE 33-8-3, completed dry the latter part of April this year. Tops at the 1 Fundis were Hunton 4,670 ft., Viola 5,150 ft., and second Wilcox 5,403 ft., with no shows found.

Kay County Wildcat Has Good Show

In the Blackwell district of west-central Kay County, a spotted area having many small pools, Skelly Oil Co. 1 Gilmore, NW NE NW 19-27-1w, northeast of Blackwell, had 500 ft. of oil in the hole after setting casing at 3,533 ft. No information tops were reported.

Second Wilcox Production In Noble County

Danciger Oil & Refining Co. et al 1 Province, NW NW SW 4-20-2w, 2½ miles east of the North Lucien field where production is found in the first Wilcox, topped the second Wilcox zone at 5,395 ft. and on drill-stem test made 625 ft. of oil with no water in 30 minutes. Last reports were that operators were setting pipe for completion tests. Other formation tops were Viola 5,198 ft., dense 5,260 ft., dolomite 5,280 ft., first Wilcox 5,315 ft. A first show of oil and gas was in a core at 5,340 ft.

OKLAHOMA COMPLETIONS

Wildcats

Lincoln County: Coralena Oil 1 State, SW SW SE 36-17-5, dry, T.D. 4,049 ft., Oswego 2,943 ft., Prue 3,035 ft., Mayes 3,595 ft., Viola 3,852 ft., Wilcox 3,937 ft.

Eason Oil 1 Erwin, NE NW 32-15-2, dry, T.D. 5,493 ft., Layton 3,615 ft., Oswego 4,430 ft., Woodford 4,975 ft., Misener 5,052 ft., Hunton 5,076 ft., Sylvan 5,095 ft., Viola 5,130 ft., Dense 5,215 ft., Wilcox 5,309 ft., second Wilcox 5,417 ft.

McIntosh County: Phillips 1 Checotah, SE SW 16-11-17, 4,000,000 cu. ft. gas, sand 1,522-32 ft., T.D. 2,992 ft. in Wilcox. Discovery.

Pontotoc County: Stanolind 1 Mayhue, N½ NE NW 19-2-6, dry, T.D. 2,630 ft., Cromwell 1,900 ft., Pennsylvanian Caney 2,110 ft., Misssisippian Caney 2,560 ft.

Seminole County: Burns Oil 1 Harber, NE SW NW 30-9-7, dry, T.D. 4,223 ft., Mayes 3,830 ft., Woodford 3,920 ft., Hunton 4,014 ft., Sylvan 4,051 ft., Viola 4,138 ft., Dense 4,190 ft., Wilcox 4,221 ft.

Fields

Hotulke, Pottawatomie County: W. O. Allen 1 Dickerson, NE SE 23-9-4, flowed 350 bbl. through choke, Hunton 4,239-60 ft., T.D. 4,442 ft.

North St. Louis, Pottawatomie County: Vierson et al 1 Welds, SW SW 22-8-4, flowed 499 bbl., Hunton 3,933-63 ft.

Pauls Valley, Garvin County: Pure 3 Teter, SE NW NW 31-4-1, flowed 388 bbl. through choke in 4 hr., 2,658,000 cu. ft. gas, sand 3,855-4,037 ft.

Miscellaneous

Creek County: Sinclair Prairie 42 Berryhill, SE NW SE 16-17-12, dry, T.D. 1,586 ft., input well.

Gulf 35 Berryhill, NE SE NE 17-17-12, dry, T.D. 1,580 ft., input well.

Gulf 34 Vowell, NE SW 16-17-12, dry, T.D. 1,590 ft. input well.

Gulf 36 Vowell, SW NE SW 16-17-12, pumped 41 bbl., sand 1,419-1,579 ft., T.D. 1,583 ft.

Wise Drlg. and Bruin Oil 1 Harjo, SE SW NE 28-14-10, flowed 75 bbl., Dutcher sand 2,710-18 ft.

Okmulgee County: F. O. Misner 11 Towne, NW SW NW 27-15-14, dry, T.D. 1,410 ft.

Seminole County: Wood Oil 1-A Lincoln, SE SE NW 34-9-6, pumped 132 bbl., Wilcox 4,067-4,114 ft.

Recompletions

Kay County: Burks Development Co. 1 Hunschild, NE NE SW 8-28-1w, dry, T.D. 3,672 ft., old T.D. 3,516 ft.

McIntosh County: J. E. Weihle 3 Smith, SE SW SE 32-9-16, dry, T.D. 1,377 ft., old T.D. 900 ft.

Noble County: Lake Oil 1 Guthrie, SW NW SE 31-21-2w, pumped 80 bbl., 5,462-78 ft., old T.D. 5,442 ft.

Okfuskee County: Sinclair Prairie 4 Fisher, NW SW SW 19-10-9, pumped 40 bbl., T.D. 1,860 ft., old T.D. 1,837 ft.

Seminole County: Pure 1-B Strathers, NW cor. 36-9-6, pumped 18 bbl., T.D. 4,194 ft.

Rocky Mountain Area

(Continued from Page 73)

gomery-Vanderpas 9 Helgerson, SW SE SE 28-35n-1w, T.D. 1,570 ft., contact 1,465-68 ft., acid, flowed average 25 bbl. on 10-day test.

Prevol & Shay 11 Waite, SE NE NE 24-35n-2w, T.D. 1,525 ft., flowed average 25 bbl. from contact on 10-day test after acid.

Big West 1 Vial, C SW SW 31-35n-4w, T.D. 2,334 ft., contact 2,310-15 ft., show oil failed to respond to acid, P.B. to 2,145 ft. and completed in Cut Bank, top 2,150 ft., for 7,602,000 cu. ft.

Gotkool
WATER CANS
& COOLERS
GOTT Water Cans are the practical way to keep drinking water cool for long periods, protected from impurities and always handy to the job. Snug fitting large removable top, strongly built to withstand rough usage. GOTT Water Coolers have extra large covers and a handy non-lecking push button faucet. Your Supply Store has them, get one today!
GOTKOOL WATER CAN
GOTKOOL WATER COOLERS
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
KEEP PURE DRINKING WATER ALWAYS HANDY

McEVOY
COMPANY
"OIL WELL EQUIPMENT" SINCE 1906
TEXAS AT MILBY • HOUSTON, TEXAS • TELEPHONE C-4-1861
SEE McEVOY'S 20 PAGE SECTION IN YOUR COMPOSITE CATALOG
CHRISTMAS TREES
COUNTER HYDROSTATIC GAS LIFTS
SCREENS
PACKERS • SET SHOES

NORTH CENTRAL TEXAS

Marble Falls Yields Oil in Jack County Wildcat

By ROBERT INGRAM

WICHITA FALLS, Tex.—A new oil pool in southern Jack County was probable last week at Joe Worsham 1 Hensley, T. Martinez Survey, 7 miles south of Jacksboro and 3 miles southwest of a recent Strawn sand discovery of the same operator. The well flowed by heads from Marble Falls sand topped at 5,295 ft. after gas blew tools up the hole. It filled pits with an estimated 150 bbl. of oil and made an estimated 2,000,000 cu. ft. of gas.

The well was killed and the wire line cut, leaving the tools in the hole and operator was fishing. When tools are recovered, a string of 5½-in. casing will be run.

Meantime, at the Strawn sand (also basal Pennsylvanian) strike to the northeast, Steed & Cooper 1 Flowers, D. Crenshaw Survey, south offset to the discovery well, was drilling deeper below 4,160 ft. after logging saturated sand at several levels. The well topped a stray Strawn sand showing oil at 4,040 ft., found 3 ft. of the zone, then drilled sand from 4,118-27 ft., cored saturated sand from 4,127-39 ft. and was drilled in saturated sand to 4,143 ft.

In the same general area, Taubert & McKee were still attempting to get a water shutoff in their probable Ellenburger discovery at 1 Boyd, S. H. Hazel Survey, south of Post Oak. Latest report was that the casing was reperforated at 6,425-35 ft. and acidized, then the well swabbed salt water. It will be squeezed and reperforated higher.

New Well at Spring Area

Continental Oil Co. 3 Spring, Section 23, Block 4, H.&T.C. Survey, in the Spring Nocona lime pool of eastern Clay County, set 7-in. casing at 5,612 ft., with total depth of 5,613 ft. Nocona lime was topped at 5,606 ft. Saturated lime was drilled from 5,646-61 ft., and on early tests the well was swabbing at the rate of 12 bbl. an hour, natural.

Wildcat Progress

New wildcat for central Wilbarger County was Danciger Oil & Refineries 1 Leslie B. Gardner, 660 ft. from the south and west lines of SW Section 53, Block 14, H.&T.C. Survey. . . . Phillips Petroleum Co. 1 Wildora, Section 8, Block 4, H.&T.C. Survey, 3 miles southwest of Dundee in northwestern Archer County, topped a lime section at 3,114 ft. and drilled lime with an odor of oil from 3,114-23 ft., then recovered 50 ft. of mud on a drill-stem test. . . . Continental 1 Penn, Block 59, A. Topper Survey, 6 miles north of Bowie in Montague County, topped dolomite at 7,213 ft. and was drilling below 7,249 ft. seeking Simpson production. . . . Sinclair Prairie 1 Henderson, W. E. Martin Survey, 1½ miles east of Denver in Montague County, was drilling by drill pipe in the hole at 4,860 ft.

NORTH CENTRAL TEXAS COMPLETIONS

Wildcats

Montague County: Pace Petroleum 1 Armstrong, 330 ft. from S and W lines J. Reese Sur. A-629, 6 mi. north of St. Jo, dry, T.D. 4,097 ft.

Sinclair Prairie 1 Jones, 467 ft. from N line and 1,400 ft. from W line I. Singletary Sur. A-707, 1 mile east of Forrestburg, flowed 888 bbl. in 9 hr. after acid, pay in broken lime 7,173-7,236 ft., T.D. 7,236 ft., *pool opener.*

Wichita County: Martin Properties 1 J. D. Cooper, 2,850 ft. from E line and 330 ft. from S line Blk. 5, H. Hastie Sur. A-92, 7 mi. northwest of Wichita Falls, pumped 35 bbl., sand 1,306-15 ft., T.D. 1,315 ft., *pool opener.*

Fields

Bunger, Young County: Lewis Production and Selby 1 R. D. Owen, 660 ft. from S and W lines of C. E. F. Auburg Sur. A-1663, ½ mile northwest of Oil City, dry, lime 4,017 ft., T.D. 4,036 ft.

Graham, Young County: Selby and Lewis Production 1 M. G. Cheney, 467 ft. from S and E lines of G. N. Potter Sur. A-1512, flowed 24 bbl. oil plus 50,000 cu. ft. gas, lime 3,911-4,030 ft., T.D. 4,030 ft., *southeast outpost.*

K.M.A., Wichita County: G. E. Kadane & Son 3 R. J. Bradley, 557 ft. south and 330 ft. west of northwest corner S. Holloway Sur. A-497, but in U. G. Gahagan Sur. A-456, flowed 945 bbl., sandy lime 3,728-3,880 ft., T.D. 3,880 ft.

K.M.A.-Ellenburger, Wichita County: Lewis Production and Selby 11-E A. Mangold, 606 ft. from S line and 467 ft. from E line Lot 36, P. Castleman Sur. A-35, flowed 943 bbl. after acid, pay 4,272-4,314 ft., T.D. 4,314 ft.

Tide Water 4-E A. Mangold, 2,331 ft. from S line and 467 ft. from W line Lot 39, P. Castleman Sur. A-35, potential 732 bbl., acid, pay 4,247-4,315 ft.

Tide Water 5-E A. Mangold, 3,634 ft. from S line and 810 ft. from W line Lot 38, P. Castleman Sur. A-35, dry, dolomite 4,349-80 ft., T.D. 4,380 ft.

Ringgold, Montague County: Superior 2 W. D. Seay, 1,308 ft. from S line and 527 ft. from E line of SW Sec. 30, H.&T.C. Sur., Blk. 4, dry, T.D. 5,882 ft.

Thornberry, Clay County: Akin et al 1 J. B. Patrick-D, 990 ft. from S line and 1,320 ft. from W line

(Continued on Page 84)

THAT test the ingenuity, resourcefulness and ability of any service organization. Our 20 years of experience are more valuable to our customers today than ever before. As a central organization, working between field and factory, we are able to save customers down-time, money and worry. And we are never happier than when we're helping to solve those problems!

We have our own inventories; we know operators who have equipment for sale; we represent many manufacturers who are prepared to make immediate shipments against rated orders.

LET US KNOW YOUR REQUIREMENTS!
WE'LL DEMONSTRATE OUR SERVICE.

LUCEY EXPORT CORPORATION, NEW YORK — LONDON

LUCEY PRODUCTS CORPORATION
OIL WELL SUPPLIES
TULSA, OKLAHOMA

Expansion of Old Areas and Increased Prospecting Seen

By VICTOR LAURISTON

CHATHAM, Ont.—Crude and natural-gasoline production from all Alberta fields for the week ending May 25 averaged 28,593 bbl. daily, compared with 28,249 bbl. daily for the previous week and 26,640 bbl. daily for the corresponding week last year.

Allowable production of crude in Turner Valley during June has been set by the Alberta Conservation Board at 26,282 bbl. daily, compared with 26,260 bbl. daily in May for 184 wells.

Development Along Alaska Highway

Negotiations are in progress between the United States and Canadian governments looking to the joint development for defense purposes of potential oil fields in the Canadian North convenient to the Alaska Highway. The projects under consideration, but not definitely decided, include the further development of the small Fort Norman field, with a pipe line some 460 miles to White Horse in the Yukon Territory and construction of a refinery at the latter point. The present output of three shallow wells in the Fort Norman field, with a daily potential around 300 to 400 bbl., refined locally in the summer months, has been adequate to supply the requirements of the immediate territory. Expansion of operations might include all-the-year-round operation of the field, with the drilling of possibly 12 to 20 additional wells this season.

Tar-Sand Pipe Line

T. A. Crerar, federal minister of resources, has announced that responsible interests are considering the building of a pipe line from the northern Alberta tar-sand area near McMurray to the more settled portion of western Canada. The minister expects that, in the not very distant future, this pipe line will become an active commercial proposition. The most likely southern terminus for the line would be Edmonton.

Floyd Beach, of the Alberta Conservation Board, states that three main problems of production from the tar sands are mining, separation of the bitumen from the sands, and refining of the bitumen. Two companies have overcome the technical problems to a point where small scale production for northern requirements is profitable; and one of these last year turned out 20,000 bbl. of crude, largely as a result of improved methods of mining the sands.

Survey Parties in Alberta

Four Dominion Government geological survey parties will work this season on potential oil structures in southern Alberta. A party headed by C. O. Hage will work in the Dyson Creek area, west of Turner Valley, and three other parties, headed by R. T. D. Wickenden, J. S. Stewart, and F. H. McLearn and J. F. Henderson jointly, will work on areas between Pincher Creek and Cardston. Topographical parties will work in the areas southwest of Turner Valley and south of Dyson Creek.

An order-in-council of the Alberta government provides that, where an oil company cannot reach a satisfactory agreement with the surface owner regarding drilling, the issue will be dealt with by the Alberta public utilities commissioner, G. M. Blackstock. Formerly, the issue was referred to a District Court judge. The change is expected to result in quicker decisions.

TURNER VALLEY COMPLETIONS

In West Central Turner Valley, Drillers & Producers 2, LSD 12, 7-19-2w5, finished at 8,263 ft. with the Madison at 7,836 ft., 444 bbl.

Foothills Oil & Gas 12, LSD 4, 9-21-3w5, in North Turner Valley, finished at 8,056 ft., with Madison at 7,095 ft., has been given initial allowable of 750 bbl. daily, making it the second largest producer in the field.

In North Turner Valley, Model Oils 1, LSD 8, 22-20-3w5, originally finished at 5,905 ft. with Madison limestone at 5,800 ft., is deepening below 6,320 ft. and will be continued through the lower porous zone. The recent production, around 85 bbl. daily, has been increased to more than 300 bbl.

Faulting in North Turner Valley

Some faulting is indicated in two wells drilling north of the Turner Valley proven area. Hastings Royalties 1, LSD 3, 30-21-3w5, has had four repetitions of the cardium sandstone marker and is in upper Benton formation below 6,730 ft. indicating considerably deeper drilling than had been anticipated. Immediately south and west, Bonaventure Royalties 1, LSD 16, 24-21-4w5, faulted back from Blairmore to lower Benton at 5,690 ft. but is still expected to get the limestone at practicable depth.

To Test Erickson Coulee Structure

Arrangements have been made between National Petroleum Corp. of Calgary and Vulcan Oils, of Vulcan, Alta., for joint testing of acreage on the Erickson Coulee structure in southern Alberta and the Ghost River structure in the foothills north of Calgary. Permit has been secured covering 16,000 acres at Erickson Coulee, in Township 1, Ranges 12 and 13w4, on the international boundary east of Coutts and due north of the Kevin-Sunburst field, while a subsidiary company with Montana incorporation will hold 7,000 acres of landowners leases on the Montana side of the structure. Two tentative locations have been made on the Alberta acreage for tests to be drilled to the lime, at 2,300 and 2,600 ft., respectively. The structure was previously tested by Northwest Co. 1, LSD 13, 8-1-12w4, which had a large gas flow at 2,531 ft. and is capped.

Exploration permit has also been secured for some 24,000 acres on the Ghost River structure, in Townships 26 and 27, Range 7w5, immediately north of the Morley Indian Reserve. An unfinished test, Baymar 1, 5-27-6w5, east of the Ghost River holdings, got a shallow gas show at 853 ft.

Vermilion and Tilley Fields

In the Vermilion field, eastern Alberta, Alberta Southern 1, LSD 15, 20-50-5w4, finished around 1,787 ft.,

(Continued on Page 91)

LEGAL

United States Department of the Interior, District Land Office, Evanston, Wyoming. Notice is hereby given that the oil and gas deposits in the NW¼ SE¼ Sec. 27, T. 27 N., R. 113 W., 6th P.M., La Barge field, Wyoming, are offered to the responsible qualified bidder of the highest bonus per acre for a lease under Section 17 of the amendatory leasing act of August 21, 1935 (49 Stat. 674) at the royalty rate scale in the lease form shown in Circular 1386 at a sale to be held in the district land office, Evanston, Wyoming, at 10:00 A.M. on July 14, 1942. The successful bidder must deposit with the Register on the date of sale a certified check on a solvent bank or cash for 1/5 of the amount bid and file the showing of qualifications to receive a lease as required by Section 7 of Circular 1386. The remaining 4/5 of the amount of the bid, together with the first year's rental of $1.00 an acre must be paid and a $5000 corporate surety bond furnished prior to issuance of the lease. All bidders are warned against violations of the provisions of Section 59 of the United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretar. of the Interior. Register.

C-F
Weighted Illuminating
REGULATORS
Give Precise Control at Very LOW PRESSURES
The C-F regulator here illustrated may be used as reducing regulator, relief valve, or zero governor. It is designed for sensitive and sure operation governing the flow of low pressure gas to industrial burners, heat-treating furnaces, atmosphere controllers, inert gas generators, etc. Is an excellent district governor. Gives precise regulation of extremely low pressures at slight differential. Maximum inlet pressure 40 pounds, outlet range from atmosphere to 5 pounds. Sizes 1" to 2" screwed; 2" to 12" flanged. C-F Regulators cover all needs of pressure control as applied to gas, air, oil, water, steam. Write for more specific data.
THE CHAPLIN-FULTON MFG. CO.
38 PENN AVE.
PITTSBURGH, PA.

BIG LAKE PLANT Cooled by YOUNG-HAPPY UNITS

Designed to supply power for pumping 150 wells averaging 3,000 ft. deep . . . for the main pump station . . . natural gasoline plant . . . and for other needs . . . the Big Lake Oil Company's plant in Reagan County, Texas, is probably the largest of its kind ever constructed. A main feature of this 2,250 KW installation shown here is the design of its cooling system. Two separate systems are provided. A battery of six YOUNG-HAPPY units engineered and manufactured by Young Radiator Company, cool the jacket water from six 600 h.p. gas-convertible engines. Three *smaller* YOUNG-HAPPY units cool water circulating to the lubricating-oil heat exchangers. Capacity of the larger system is 2,000 g.p.m.; the other system, 475 g.p.m.

Like other YOUNG-HAPPY installations, this one is cutting costs and meeting every cooling requirement. If you have a cooling problem, consult with YOUNG engineers. There is no obligation.

YOUNG RADIATOR COMPANY
Dept. 222-F. Racine, Wis., U.S.A.

Mid-Continent Distributor—The Happy Co., Tulsa, Okla.
Pacific Coast Distributor—A. R. Flournoy, Bell, Calif.

Young HEAT TRANSFER PRODUCTS
OIL COOLERS • GAS GASOLINE UNIT HEATERS • CONVECTORS
DIESEL ENGINE COOLING RADIATORS • CONDENSERS • EVAPORATORS •
• INTERCOOLERS • HEAT EXCHANGERS AIR CONDITIONING UNITS •
ENGINE JACKET WATER COOLERS HEATING COILS • COOLING COILS
Young SERVICE SPECIALIZING IN HEAT TRANSFER PRODUCTS

PAGE FENCE

America's First Wire Fence—Since 1883

BARRIER AGAINST INTERFERENCE WITH MOTOR FUEL PRODUCTION

● No one can predict where treachery may attempt to strike, but oil plants can and will set up protections. Logically the first barrier should be at all property lines. Two important factors favor Page Industrial Fence. The first woven wire fence was Page Fence, and for 59 years its makers have held a forefront position in major developments. Page also originated localized experience and responsibility in fence engineering and erecting. When you specify Page Fence you deal with a nearby business man—one of 102 technically-trained, long-experienced firms which own their own plants and comprise the PAGE FENCE ASSOCIATION, Headquarters: Monessen, Pennsylvania.

VICTORY FIRST
At the Page mills, men, machines and materials are on an all-out schedule for production of fence to protect plants working on Government orders

PRODUCT OF PAGE STEEL & WIRE DIVISION—AMERICAN CHAIN & CABLE COMPANY, INC., BRIDGEPORT, CONN.

NO. LOUISIANA, ARKANSAS

East Outposts to Midway Field on Crest of Fold

SHREVEPORT, La.—Completion of Barnsdall Oil Co. 4 and 5 Roberts in Section 11 and 14 of the Midway field continues the southeast trend and broadens the field on that end. No. 4 Roberts found top of porosity at —6,065 ft. and 5 Roberts, a south offset, found porosity at 38 ft. lower or —6,103 ft.

Top of the Cotton Valley formation in the 4 Roberts was 4,872 ft. and 4,925 ft. at 5 Roberts, while at the northeast end of the field, Barnsdall 1 Spencer-Gunter, SW SE 5-15-24, found Cotton Valley at 5,005 ft., indicating that it is running low. On last report it was drilling below 5,100 ft. in shale. Location has been made for a 1-mile southeast outpost to the field. Southwood Oil Co. is reported starting a test in the SW NW 18-15s-23w.

About 4 miles west of McKamie, Tide Water Associated is rigging up its 1 Amanda Bendaw which will be the second test for the Patton field, Lafayette County. The discovery well in this field was abandoned due to production difficulties.

ARKANSAS COMPLETIONS

Dorcheat, Columbia County: R. A. Stacy et al 1 Barton, 11-18s-22w, flowed 198 bbl. through choke, pay 8,832 ft., T.D. 8,960 ft.

Macedonia, Columbia County: Magnolia 1 Willis, 17-18s-21w, flowed 273 bbl. distillate, gravity 62, perf. 8,918-28 ft., T.D. 8,935 ft.

Midway, Lafayette County: Barnsdall 4 Roberts, SE SE 11-15s-24w, flowed 616 bbl. through choke, Smackover lime 6,337 ft., T.D. 6,469 ft.

Barnsdall 5 Roberts, NE NE 14-15s-24w, flowed 648 bbl. through choke, Smackover lime 6,371 ft., T.D. 6,470 ft.

Stephens, Ouachita County: Haynes B. Ownby Drlg. et al 1 Boyce, 7-15s-19w, pumped 240 bbl., sand 3,455-66 ft.

Haynesville Remains Most Active Field in North Louisiana

The Haynesville pool of Claiborne Parish continues to be the most active spot in North Louisiana. Three completions brought the total number of producers to 41. Seven new locations were announced last week, giving the field some 25 active rigs. In the Sugar Creek field, White & Hughes 1 Byrd was completed as a gas well, while in the same area Carter Oil Co. 2 Dobbins showed 35 stands of oil on a 15-minute drill-stem test at 5,795-5,850 ft.

In Bossier Parish, Cloban Oil Co. was moving in materials for a wildcat, 1 Horne, in 16-16-15, while in the Bellevue area of Bossier, Phillips Petroleum spudded its deep test, 1 Kendrick, in 22-19-11.

NORTH LOUISIANA COMPLETIONS

Haynesville, Claiborne Parish: Arkansas Fuel Oil 1 Sherman-Harp, 22-23-8, flowed 300 bbl. through choke, T.D. 5,400 ft.

Blackwell Oil & Gas 1 Waller, 11-23-8, flowed 240 bbl. in 8 hr. through choke, T.D. 5,425 ft.

Mid-States Oil 1 Aiken, 26-23-8, flowed 30 bbl. an hr., T.D. 5,575 ft.

Ohio Oil 3 Hunt, 9-23-8, flowed 49 bbl. an hr., T.D. 5,480 ft.

Nebraska-Missouri

(Continued from Page 74)

Its 1 Smith in E½ SE SE 3-1n-14e, about a mile north of 1 Wiltse, was drilling below 1,900 ft.

Brown & Clampitt made a Hunton producer of 1 A. B. Cornelius, which had been pointed to Viola lime, but in which drill pipe had frozen. After perforating casing the operators swabbed 10 bbl. of oil per day. They acidized with 200 gal. and swabbed 24 bbl. Another acidization with 300 gal. further improved production, but the rate was not given.

NEBRASKA COMPLETIONS

Skelly Oil Co. 6 Roesch, NW SW 36-3n-16e, pumped 240 bbl. oil, Hunton 2,410-31 ft., T.D. 2,468 ft.

Paluxy Sand Production Is Indicated in Wood County

By ROBERT INGRAM

DALLAS, Tex. — Production from the Paluxy sand, first in the Tyler Woodbine basin, was probable last week at Amerada Petroleum Corp. 1 C. B. Kennemer, James Knight Survey, 8 miles west of Winnsboro in northern Wood County. A "hot" play, first in many months, sprang up when a good sand body was found in the Paluxy early in the week. Reaction was far more favorable than at the Concord low-gravity discovery early this spring in Anderson County, probably because the showing opens new horizons for exploration.

An electrical survey, run to total depth at 6,352 ft., picked up the top of the Paluxy at 6,249 ft. and showed a 90-ft. section of nearly solid sand with pay indications and no water showing. A core was then cut to 6,354 ft., getting 2 ft. of hard, tight sand and some shale. Next core, at 6,354-74 ft., recovered only 18 in. of formation, the top 15 in. being shale and the last 3 in., white water sand. Taking 6,249 ft. as top of the section and with elevation of 453 ft., the Paluxy would fall at —5,796 ft., or 243 ft. high to Amerada 1 Lloyd, Barnhill Survey, a failure drilled about 2 miles south in 1940. Normal dip would account for some of the difference.

Well Correlates Low

However, when correlated with George Strake 1 Farrier, Jesse Walker Survey, a 1939 failure about 2 miles west, the well was figured 83 ft. low. Because of these conditions, there was some speculation as to structural conditions, some holding that a saddle divides the Kennemer well from the Strake well, while others placed in over a fault.

In any event, the discovery was of major importance since it proves for the first time that the Paluxy will pay off within the limits of the basin. Only two fields have been found in the Paluxy in the East Texas district—Talco and Sulphur Bluff, both fault-line structures north of the main basin and both producing low-gravity, asphaltic-base crude. Those who examined the cores from the Kennemer well said the saturation gave indications of the sand yielding 25 to 30-gravity oil. The structure is apparently without a gas cap like that at Sulphur Bluff and Talco.

At week's end, while Amerada was cementing a string of 5½-in. casing at 6,379 ft., 5 ft. off bottom, Jerry Hawkins, Tyler independent, rushed plans to give the area its second operation on a lease he holds about 1,300 ft. northeast of the discovery prospect. The Hawkins location will be on the 138-acre J. M. Clark tract in the Berry Smith Survey. It was also reported that Magnolia Petroleum Co. was awaiting results of the test at 1 Kennemer to determine location for a test.

Another area attracting attention as a result of the showing was north of the Chapel Hill pool in Smith County where the Paluxy already produces gas and distillate. And in southeast Hunt County, Hollandsworth Drilling Co. staked a possible Paluxy sand test 660 ft. out of the northwest corner of an 82.4-acre tract in the John Warren Survey, about 10 miles southeast of Greenville, to be known as 1 J. D. Baker, an attempt to get on the upthrow side of the fault indicated at a recent dry hole. Cable Tool Drilling Co. 1 J. D. Williams, William Elam Survey, northwest of the present location.

Hawkins Work Slowed

No new operations were listed in the Hawkins pool of Wood County for the first time since the field was discovered late in 1940. The week previous there was only one location. Completions, largely of wells drilled by the Humble Oil & Refining Co., dropped off from 26 in January to an average of 15 a month through May, and are expected to halt in a week or two with a total of about 335 producing wells in the field.

Another Smackover Test

Another Smackover lime wildcat was slated to get under way this week at Mudge Oil Co. 1 D. E. New, A. Vanzela Survey, 4½ miles south of Mexia on a block of about 2,500 acres worked with two kinds of geophysical instruments. At the same time, however, it was reported that plans for a test southwest of Groesbeck in southwestern Limestone County, previously announced, had been abandoned.

EAST TEXAS COMPLETIONS

Wildcats

Kaufman County: Brown-Hancock Oil 1 R. L. Warren, J. C. Moses Sur., 5 mi. southwest of Terrell, dry, Austin chalk 1,918 ft., Woodbine 2,405 ft., Red Beds 2,525 ft., T.D. 3,016 ft.

Fields

Hawkins, Woods County: Humble 4 S. H. Moore, J. Pollock Sur., flowed 325 bbl. through ¼-in. choke, perf. 4,706-12 ft. and 4,739-44 ft., T.D. 4,835 ft.
Humble 1-C F. B. Ponder, J. Pollock Sur., flowed 95 bbl. in 6 hr. through ¼-in. choke, T.D. 4,864 ft.
Humble 5 N. M. Shamburger, J. Pollock Sur., flowed 411 bbl. through ¾-in. choke, perf. 4,766-71 ft. and 4,852-60 ft. and 4,879-85 ft., T.D. 4,892 ft.

Texas Gulf Coast

(Continued from Page 77)

tested have not been released. It is reported that the company is preparing to move in a small rig and shallow development around the structure will be continued.

Two other Wilcox tests were being watched with much interest. One is Superior and Atlantic 1 McMahon located in the Deering Creek area, about 5 miles east of the Lake Creek field, Montgomery County. The well is coring ahead below 12,200 ft., and is reported to have logged gas and distillate showings, but details as to where they were logged were not available. The other wildcat is Humble 1 Goolsbee, 2½ miles north of Warren, Tyler County, which is drilling ahead below 8,200 ft. The Wilcox was topped at 7,464 ft., and showing of oil and gas have been logged in the upper section at 7,600-7,700 ft.

An extension of several hundred feet east was recorded for the new South Ganado field, Jackson County, with the completion of Gulfboard 2 Harmon. With the hole bottomed at 5,381-89 ft., completion was made by perforating casing opposite sand at 5,381-89 ft., and the well is flowing at the rate of 13 bbl. of pipe-line oil per hour through ⅛-in. choke. This is the second producer for the structure and present information indicates a field of considerable size.

TEXAS GULF COAST COMPLETIONS

Wildcats

Harris County: H. M. Christie 1 Foster Lumber Co., T.D. 8,511 ft.
Jackson County: Moore & Ahern 1 J. M. Heard, dry, T.D. 5,282 ft.

Fields

Ganado, Jackson County: Humble 5 Branch, 130 bbl., ⅛-in. choke, perf. casing 5,518-22 ft., T.D. 6,700 ft.
Lake Creek, Montgomery County: Superior 4-A McWhorter, 252 bbl., ¼-in. choke, perf. casing 9,280-90 ft., T.D. 10,323 ft.
Maurbro, Jackson County: Humble 6 Drushel, 174 bbl., ¼-in. choke, sand 5,212-33 ft.
Mayo, Jackson County: W. S. Boyle 1 Strouhal, no gage taken, perf. casing 5,330-35 ft., T.D. 5,553 ft.

G. A. WELDING Shop Notes

NO "BLUEPRINT BLUES"

Before any order goes into the shops of the General American Plate and Welding Division, it must first visit the Engineering Department. Here a technically trained staff details each operation, either from customer's rough sketches or finished drawings. All shop procedure is scheduled for rapid and accurate execution. There are no "blueprint blues" at Sharon — because each line of every diagram is checked by men who know steel and know fabrication through years of experience.

PLATE AND WELDING DIVISION
GENERAL AMERICAN TRANSPORTATION CORPORATION
Cable Address GENTANWELD Sharon, Pa.
GATX GENERAL AMERICAN
PLATE & WELDING DIVISION
PLANT AT SHARON, PA.
Offices In All Principal Cities

J. K. ROSS, Broker
Oil Insurance, all Classes, nationwide
Loans on Producing Properties
with
Langham, Langston & Burnett
Cotton Exchange Bldg. Houston, Texas

L. Crouch J Stoner, no gage taken, perf. casing 5,406-10 ft., T.D. 5,630 ft.
North La Ward, Jackson County: Stanolind 1 Johnson, 90 bbl., ⅛-in. choke, perf. casing 5,216-24 ft., T.D. 5,275 ft.
Withers, Wharton County: F. W. Michaux 40-A Pierce, 188 bbl., 5/32-in. choke, perf. casing 5,329-34 ft., T.D. 5,360 ft.

Louisiana Gulf Coast

(Continued from Page 76)

Oil & Refining Co. 3 Manufacturers Record Publishing Co. is reported to be flowing at the rate of 450 bbl. daily through a small size choke from sand below 11,100 ft. Details as to where the sand was logged were not available. This apparently is a new and deeper sand for the structure which heretofore has produced from two sands at approximately 9,900 ft. and 10,200 ft.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

Cameron Parish: Superior 1-D Miami Corp., dry, T.D. 10,453 ft.
Iberville Parish: Amerada 1 Williams, dry, T.D. 11,933 ft.

Fields

Abbeville, Vermilion Parish: Continental 4 Sellers, dry, T.D. 10,533 ft.
Bayou des Glaize, Iberville Parish: Humble 1-B E. B. Schwing, dry, T.D. 6,625 ft.
Bayou Sale, St. Mary Parish: Atlantic 4 St. Mary Parish Land Co., 202 bbl., ⅛-in. choke, perf. casing 10,338-35 ft., T.D. 12,210 ft.
Atlantic 5 St. Mary Parish Land Co., 24 bbl. distillate, ⅛-in. choke, perf. casing 10,202-42 ft., T.D. 11,861 ft.
Chacahoula, La Fourche Parish: Sun 6 Cypress, 132 bbl., ⅛-in. choke, perf. casing 7,790-7,825 ft., T.D. 8,225 ft.
Delta Farms, La Fourche Parish: California 4 Delta Farms, 340 bbl., 5/32-in. choke, perf. casing 9,010-50 ft., T.D. 11,328 ft.
Erath, Vermilion Parish: Humble 2 Vermilion Parish School Board, 95 bbl. distillate, ¼-in. choke, perf. casing 11,042-50 ft., T.D. 11,352 ft.
Phillips 1 Broussard, 69 bbl., 10/64-in. choke, perf. casing 11,160-72 ft., T.D. 11,752 ft.
Lafitte, Jefferson Parish: Texas 1 Leon Rojas, dry, T.D. 10,742 ft.
Lewisburg, Acadia Parish: Stanolind 1 Wimberly, dry, T.D. 10,000 ft.
Lake Salvador, St. Charles Parish: Texas 14 State, 552 bbl., 7/32-in. choke, perf. casing 9,670-9,708 ft., T.D. 10,255 ft.
Roanoke, Jefferson Davis Parish: Union Sulphur 1 Perl, dry, T.D. 9,641 ft.

North Central Texas Fields

(Continued from Page 80)

Sec. 82, Byers Brothers subdivision, dry, T. D. 1,224 ft.
Akin et al 2 J. B. Patrick-A, 330 ft. from W and S lines of north 30 acres of west 70 acres of Sec. 82, Byers Brothers subdivision, pumped 49 bbl., sand 1,120 ft., T.D. 1,127 ft.
W. H. Spradling 1 C. T. Taylor est.-Elliott, 2,000 ft. from S line and 636 ft. from W line Blk. 56, Bacon subdivision, potential 100 bbl., sand 1,127 ft., T.D. 1,137 ft.

Miscellaneous

Archer County: Morgan & Turner 11-A R. J. Andrews, 1,050 ft. from N line and 612 ft. from W line Sec. 2437, T.E.&L. Sur., 30 bbl., sand 1,407 ft., T.D. 1,416 ft.
C. F. Schram et al 5-A Daume, 2,273 ft. from N line and 792 ft. from W line Sec. 1, S.P.R.R. Sur. A-266, dry, T.D. 695 ft.
W. E Production 1 A. Wilhelm, 1,900 ft. from S line and 660 ft. from W line Sec. 2420, T.E.&L. Sur., dry, T.D. 1,530 ft.
Young County: Kerlyn Oil 1 E. C. Garvey, 947 ft. from N line and 2,353 ft. from E line Sec. 4, G.B.N. Sur. A-119, old well, perf. 4,300-14 ft., acid, potential 37 bbl. oil and 50 bbl. salt water, P.B. 4,322 ft.

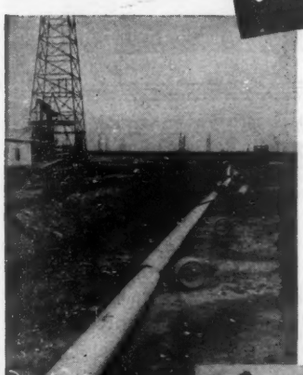
Pipe-Line Connections Made With Discovery of Camp Colorado Area

FORT WORTH, Tex.—Pumping equipment has been installed and Sinclair Prairie Pipe Line Co. has made connection with Holland & Hoffman 1 Dr. R. Bailey, Section 17, H.T.&B. Survey, discovery well in the Camp Colorado area of Coleman County. The well was recently completed at a total depth of 2,793 ft.

The Railroad Commission has issued a permit to move 500 bbl. of oil for testing purposes and

PROBL How to handle salt-water disposal efficiently and economically

SOLUTIO J-M TRANSITE PIPE ...and here's WHY—



Easy to install. Transite's light weight, long lengths and simple assembly mean rapid installation, low costs.

Joints stay tight... Because leakage is minimized by the Simplex Coupling, there's little danger of crop damage or soil pollution.

Low maintenance. Non-metallic, Transite is made of asbestos and cement. Cannot rust. Easily salvaged for new locations.

Transite Pipe is ideal for lead lines as well as for salt-water lines. Brochure DS-320 gives all the facts. For your copy, write Johns-Manville, 22 East 40th Street, New York, N. Y.

Transite offers unusual resistance to corrosive salt water inside, acid soil outside.

Even unskilled crews can install Transite Pipe quickly and economically.

JM Johns-Manville
TRANSITE PRESSURE PIPE
For Salt Water Disposal Systems and Lead Lines

STEADY PRESSURE READINGS...

... from a distance of 30 feet or more!

The Abercrombie Pressure Gauge is not affected by external vibrations. Pump pulsations are dampened over the entire pressure range without adjustments. Billboard figures behind a colorless, unbreakable plexiglass face are read at a glance. Little wonder drillers all like the ABERCROMBIE PRESSURE GAUGE. It has definitely taken pressure gauging out of the delicate instrument class.

ABERCROMBIE PUMP CO., Gulf Bldg., Houston, Texas

ABERCROMBIE
PRESSURE GAUGE

4 BOOKS FOR YOUR "MUST" LIST

Done In Oil—LEVEN $10.00
Practical Oil Geology—HAGER $4.00
Petroleum Refinery Engineering—NELSON $6.00
General Engineering Handbook—O'ROURKE $4.00

Book Dept., The Oil and Gas Journal

operators expect a daily allowable of around 120 bbl. Storage and water tanks have been full for several days, and potential will be taken after these are emptied.

Deep Wildcat Starts in Jones

First deep wildcat of the year for Jones County was staked by Tom D. Humphrey in SE Section 36, Block 16, T.P. Survey, in the southeastern part of the county, 2 miles southeast of the shallow Sayles pool. Four shallow failures, deepest of which went to 2,743 ft., have been drilled by other operators on the acreage.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Callahan County: Francisco & Miles 1 J. M. Isenhower, Sec. 2978, T.E.&L. Sur., dry, T.D. 667 ft.

T. S. Stanfield 1 D. F. Hart, 1,050 ft. from N line and 750 ft. from E line of SW of Sec. 16, D.&D.A. Sur., dry, T.D. 848 ft.

Brown County: R. M. Ragsdale et al 1 O. B. Richardson, J. L. Phinn Sur., 300,000 cu. ft. gas, lime 1,102-19 ft., natural, T.D. 1,119 ft.

Jones County: Ungren & Frazier 1 Eleanor Haynes, Henry Millard Sur. 243, dry, T.D. 2,008 ft.

Fields

Blake, Brown County: E. H. R. Sabens 1 J. C. Howell, heirs of Jos. M. Harris Sur. 784, dry, T.D. 1,236 ft.

Echo, Coleman County: Anzac Oil et al 1 J. P. Morris est.-T, Leander H. McNeil Sur. 284, pumped 34 bbl. oil plus 40 per cent water natural, sand 2,035-58 ft., T.D. 2,143 ft., P.B. 2,063 ft.,

Nail, Shackelford: Hickock & Reynolds 5 J. C. Nail-C, Sec. 133, E.T. Sur., pumped 212 bbl. after acid, lime 1,607-12 ft., T.D. 1,612 ft.

Merkel, Taylor County: Fain-McGaha 2 Ruel H. Perry, Lot 5, Grimes C.S.L. Sur., pumped 136 bbl. after acid, lime 2,606-20 ft., T.D. 2,637 ft.

Permian Basin, Panhandle

(Continued from Page 70)

ley. The Texas Co. is shooting in Randall County.

TEXAS PANHANDLE COMPLETIONS

Carson County: Power Petroleum 3 Ware (Jordan), Sec. 124, Blk. 4, I.&G.N. Sur., potential 106 bbl., T.D. 3,145 ft.

Hutchinson County: Continental 3 Johnson-E, Sec. 5, Blk. 1, B.&B. Sur., flowed 35 bbl. oil and 390,000 cu. ft. gas.

Ora Huey 2 Whittenburg, Sec. 15, Blk. S-02, H.& O.B. Sur., potential 171 bbl., T.D. 3,019 ft.

Potter County: U. S. Bureau of Mines 3 Bush-A, Sec. 27, Blk. 6, B.S.&F. Sur., gaged 16,900,000 cu. ft. gas, R.P. 720 lb., T.D. 3,580 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Square Lake, Eddy County: Sanders Bros. 4 Etz, SW SE 34-16-30, flowed 215 bbl. in 12 hr., main pay 2,983-84 ft., natural.

Barney Cockburn 5 Etz, SE SE 5-16-30, flowed 125 bbl., T.D. 2,965 ft., shot.

Maljamar, Lea County: Maljamar Oil & Gas 9-A Mitchell, SE NE 19-17-32, flowed 50 bbl. in 3 hr. through choke, natural, pay 3,990 ft., T.D. 3,999 ft.

Vacuum, Lea County: Phillips 48 Santa Fe, NW NW 25-17-35, flowed 163 bbl. through choke, pay 4,508 ft., T.D. 4,554 ft., natural.

Amendment to Spacing Order Affects Few Illinois Fields

(Continued from Page 66)

application to and its influence on future drilling and development. The plan can aid future development in two ways: First, the close spacing of wells in a newly discovered field will allow operators to proceed cautiously with the development and reduce dry holes to a minimum in attempting to determine the productive limits of the field, thus reducing to a minimum the amount of lost casing in abandoned holes; and second, closer spacing in shallow sand reservoirs of good productive capacity and slow decline characteristics will aid in raising and maintaining the Illinois crude output.

This future influence on development is probably the basis on which the plan was established since the coordinator stated that because Illinois fields are favorably located with respect to the great war industries of the Midwest, it is highly desirable for that state to contribute as much oil as possible to supply requirements during the period of serious transportation shortage. Mr. Ickes pointed out, however, that it is essential that this contribution be made on a sustained basis throughout the war period and depends on the discovery of new fields faster than the denser development and accelerated exhaustion of presently known fields.

California Fields

(Continued from Page 69)

the Navy Department wishes to support the application for the authority requested."

The Gilmore Island area in which the projected drilling would be done was originally a component part of the old Salt Lake field which has produced a considerable quantity of crude oil from the Pliocene. The area is adjacent to the celebrated La Brea tar pits which were formed in the geologic past as the result of extensive and deep-seated faulting. The productive area east of this fault was adequately sealed off and consequently the Salt Lake field produced large quantities of natural gas along with the crude oil. Many of the old wells were not effectively cemented off when they were abandoned due to the intrusion of residences and every once in a while one of the old holes begins oozing oil and small quantities of gas in the middle of some one's front or back yard. This necessitates pumping out the heavy oil, relieving the pressure and sometimes placing a cement plug in the uncased hole. This is one reason why property owners in the general area are so opposed to the reentrance of drilling in the region.

LOS ANGELES BASIN COMPLETIONS

Huntington Beach, Orange County: Southwest Exploration Co. 51 State, 4-6s-11w, pumped 360 bbl., 24.5-gravity, 0.3 per cent cut, T.D. 4,967 ft., perf. 4,189-4,967 ft., completed in Huntington Beach tideland beneath Pacific Ocean by directional drilling in rocks of Miocene age.

APPALACHIAN FIELDS

Onondaga Thickest Section Penetrated in Fayette Co.

PITTSBURGH, Pa.—In Southwest Pennsylvania, one deep test reached the Oriskany sand. There was also a fair oil well reported. In West Virginia, a deep wildcat topped the Corniferous lime.

SOUTHWEST PENNSYLVANIA

On the Fayette anticline in South Huntington Township, Fayette County, Peoples Natural Gas Co. topped a sand, presumably the Oriskany, at 7,902 ft. in the test on the Jacobs Creek Oil Co. lease. This is 585 ft. below the top of the Onondaga lime or the thickest Onondaga section yet recorded. At 7,914 ft., there was no showing of oil, gas, or water. To the top of the Onondaga. this test ran regionally high but the extreme thickness of that member places the Oriskany low.

On Chestnut Ridge in South Union Township, Fayette County, Peoples Natural Gas Co. is drilling at 3,404 ft. in 6 Piedmont Coal Co. with a fair volume of gas still present from 2,900 ft. Its 1 Walters is drilling at 910 ft.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Plum Creek Township: Apollo Gas Co. 1 Nancy Schaeffer, 88,000 cu. ft. gas, first Bradford 3,059 ft., gas 3,061 ft., T.D. 3,303 ft.

Wayne Township: Humphries, Stone & McCall 1 Thomas Peoples, gas well, no gage, T.D. 3,708 ft.

Clarion County, Clarion Township: Joseph Galbraith et al 1 W. S. M. Fleming, 142,000 cu. ft. gas, Speechley sand 2,205-42 ft., gas 2,205 ft., Bradford 2,525-84 ft., gas 2,532 ft., T.D. 2,607 ft.

Greene County, Jackson Township: Manufacturers Light & Heat Co. 3 Mary Orndoff, 722,000 cu. ft. gas, Bayard sand 3,537 ft., gas 3,539 ft., 3,552 ft., and 3,554 ft., T.D. 3,574 ft.

Equitable Gas Co. 1 W. J. Grove, drilled deeper to 3,388 ft., dry.

Washington County, South Franklin Township: Carnegie Natural Gas Co. 5 Harvey Taylor, 100 bbl., Fifth sand 2,730 ft., oil 2,745-47 ft.

WEST VIRGINIA

In Grant district, Ritchie County, Benedum & Trees topped the Corniferous at 5,643 ft. in the wildcat on the L. J. Rinehart farm and are running casing before drilling into the Oriskany sand. It is a distinct wildcat and will be viewed with interest.

In Steele district, Wood County, Glen W. Roberts et al have resumed drilling the deep test on the I. B. Robinson farm and have reached 3,435 ft. This is on the west flank of the Parkersburg syncline and will go to the Oriskany sand.

In Clay district, Hancock County, John T. Galey et al have spudded in and started drilling the Oriskany test on the Lenora Ramsey farm.

WEST VIRGINIA COMPLETIONS

Boone County, Washington district: South Penn Natural Gas Co. 1 Yawkey-Freeman, 280,000 cu. ft. gas, Big lime 1,416-1,613 ft., Injun 1,613-65 ft., Berea 2,120-45 ft., T.D. 2,151 ft.

Calhoun County, Sherman district: McCall Drilling Co. 1 Claude Wease, 211,000 cu. ft. gas and 2 bbl., Big lime 1,787-1,850 ft., Injun 1,850-1,932 ft., gas 1,909-29 ft., shot 1,909-29 ft., T.D. 1,995 ft.

Gilmer County, Glenville district: Pittsburgh & West Virginia Gas Co. 7854 Jacob Moore, 200,000 cu. ft. gas, Big Injun 1,655-1,758 ft., gas 1,728-50 ft., T.D. 1,766 ft.

Marion County, Mannington district: South Penn Natural Gas Co. 7 J. L. Erwin, 7 bbl. and 50,000 cu. ft. gas, Gordon sand, T.D. 3,200 ft.

Monongalia County, Battelle district: C. H. Clovis 1 E. C. Clovis, 1 bbl., Little Dunkard 1,450-60 ft., T.D. 1,464 ft.

Putnam County, Curry district: Summit Gas & Development Co. 2 Virgil Caldwell, 44,730 cu. ft. gas, Big lime 1,616-1,774 ft., Injun 1,805-70 ft., Berea 2,306-31 ft., T.D. 2,337 ft.

Wayne County, Grant district: Owens, Libby-Owens 26 Hoard-Baldwin, 315,000 cu. ft. gas, Big lime 1,326-1,508 ft., Injun 1,508-76 ft., shot 1,534-76 ft., T.D. 1,584 ft., R.P. 335 lb.

Wood County, Lubeck district: South Penn Natural Gas Co. 2 W. R. Bigelow, dry, through Berea, T.D. 2,061 ft.

Walker district: South Penn Natural Gas Co. 7 Monroe McPherson, 5 bbl., Berea, T.D. 2,289 ft.

ORISKANY GAS FIELDS

Jackson County, Washington district: United Fuel Gas Co. 5087 C. W. and G. S. Starcher which gaged, natural, 18,151,000 cu. ft. gas, R.P. 1,625 lb., Big lime 1,918-2,070 ft., Injun 2,070-2,130 ft., Corniferous lime 5,102 ft., Oriskany 5,214 ft., T.D. 5,225 ft. This is the largest gas well in the Jackson County pool for many months.

Ripley district: Godfrey L. Cabot, Inc., 14 J. L. McLean heirs, 4,023,000 cu. ft. gas, Oriskany 5,192 ft., shot 5,193-5,224 ft., R.P. 1,275 lb., T.D. 5,272 ft.

Kanawha County, Poca district: Columbian Carbon Co. 1 Alonzo Painter, dry, Oriskany 5,205 ft., T.D. 5,296 ft.

MAC
BALLS & SEATS

All Sizes of Balls and Seats are supplied in
STEEL BRASS
BRONZE
AND STAINLESS

Ask for complete details and price list.

McGREGOR
WORKING BARREL CO.
Bradford, Pa., U. S. A.

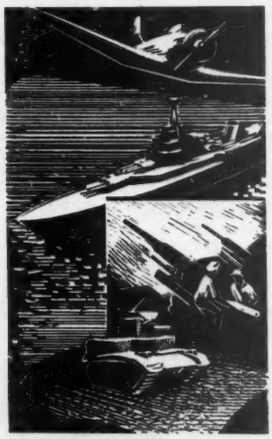
TO MEET Todays NEEDS!

• Today, more than ever before, certainty of performance has become the keynote in the manufacture of all of the products which bear the F & M brand. The patented F & M (Emsco) Rotary Brake Lining Sets have been engineered — engineered to meet the *needs of today.* • Why not get the best? Insist on genuine F & M Rotary Brake Lining. *It's obviously better!*

BUY DEFENSE BONDS AND STAMPS TODAY

F & M (EMSCO)
ENGINEERED ROTARY BRAKE LINING

FIBRE & METAL PRODUCTS, INC.
DOWNEY, CALIFORNIA

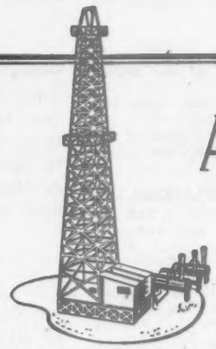


PLOMB QUALITY TOOLS HELP BUILD FOR VICTORY

All the implements of this great war must be produced with utmost speed—and nearly all such production begins with hand tools.

Throughout every phase of this production PLOMB fine hand tools—over 1200 kinds—are in tremendous demand. That's because PLOMB'S famous quality helps make swift, safe, sure production possible. The quality that has made them outstanding in ordinary use is even more important in meeting today's urgent demands of the nation. PLOMB TOOL COMPANY, Los Angeles, California.

PLOMB



Among the Drilling

Contractors Turn to Operations to Keep Crews and Equipment Busy

DRILLING CONTRACTORS are turning to operating phases of the business at an unprecedented rate during these months of curtailed development work. Less personal attention to the actual business of drilling is required under conditions of curtailed exploration, leaving contractors free time for devotion to leasing, trading, financing and the other aspects of operating.

Even before Conservation Order M-68 lowered the rate of completions by approximately 50 per cent, some contractors were undistinguishable from the operator classification. Consequently, it was a minor transition for other contractors to accept the responsibilities preliminary to the drilling of exploratory wells.

Scores of contractors throughout the country are now drilling wells on blocks assembled by themselves or "turned" to them for a well. In many instances, particularly in the cases of small organizations, the contractor is now part land man, lease broker, geologist, and remainder, in his heart at least, just plain driller.

When producing and operating companies were drilling about 30,000 wells annually, contractors per se devoted 100 per cent of their time to details of their particular functions in the industry. The business of drilling wells is a specialized field. It requires personal supervision of scores of details concerning moving, arrangement of fuel and water supplies, crew personnel, materials as well as the copious records that must be maintained for various government agencies.

Diminishment of requirements on the personal time of contractors and their key men has permitted drilling organizations to investigate the merits of the operating opportunities presented from various sources and those developed on their own initiative. Opportunities for contractors to try their hand at operating are unlimited although most drilling organizations are inclined to favor farmout deals on the fringes of producing fields. The other type of operation favored by contractors is an exploratory well based on reliable geology which offers the opportunity of selling protective acreage to major companies or of receiving contributions in cash or acreage for the drilling of a well.

Most aspects of exploratory operations are well known to contractors. They are qualified by experience and facilities to engage extensively in the operating branch of the industry but probably never before has the combination of circumstances made this phase of the business so attractive to contractors. Idle crews cannot be held intact for any length of time. Idle machinery is subject to deterioration, but most of all rigs, while stacked, are unprofitable and a financial deadweight. Therefore, contractors are, in some cases, actively soliciting prospects which involve no more than reasonable risks in order to keep their rigs and men engaged.

Contractors are in much better position to force decisions from major company land departments on a question of whether to support or ignore an exploratory operation. Operators with limited capital are frequently unable to carry through their intentions of starting wells on schedule and this uncertainty contributes to the delay and indecisions of other acreage owners or potential buyers of protective leases in the matter of supporting exploratory projects. On the other hand, contractors with an organization and equipment available for following through on drilling commitments are in position to obtain speedier devisions from directly and potentially interested companies.

•

JOHN MABEE, Tulsa contractor and operator, will drill Sunray Oil Co. 1 Schultz, C NW SE 9-22-2e, a north offset to Deep Rock Oil Corp.'s Wilcox sand discovery in Noble County, Oklahoma.

R. T. MYERS Drilling Co., Tyler, Tex., has received contract for J. D. Parsons et al 1 W. F. England, a Paluxy sand wildcat prospect on the southeast outskirts of Commerce, Hunt County, Texas. Contractor is moving in rotary rig to drill the test which is on farmout acreage received from Stanolind Oil & Gas Co.

GRAY & WOLFE, Houston, Tex., contractors, are moving in material for a 7,000-ft. wildcat test 3 miles east of La Rosa field, Refugio County, Texas. Location is on the Josephine Hoffman farm, Bonnie View subdivision, Guadalupe Cobian Survey.

OWNBY Drilling Co., Shreveport, La., has assigned rotary rig to Columbia County, Arkansas, where a well is to be drilled on the J. W. Smart farm, SW SE 12-15-20.

FALCON-SEABOARD Drilling Co., Tulsa, has two rotaries engaged in Rooks and Kingman counties, Kansas. The company's 1 Harve, CSL SE NW 25-8s-17w, Rooks County, a semiwildcat 3 miles northeast of the Dopita field and 5 miles northwest of the Laton field, is nearing top of the Topeka lime. In Kingman Coun-

Petroleum Products as Important as Gunpowder

Equipment must be absolutely trustworthy so that nothing interferes with or delays production or delivery of this vital fighting force. Simplex Emergency Jacks speed up operations by handling tough and unusual jobs quickly and safely.

These rugged, capable jacks lift their full rated capacity on cap, nonslip toe, on the auxiliary shoe that hooks on the cap, or on the hookend chain.

They can be tilted for jacking at an angle or can be used horizontally. Have double lever socket for close quarters.

They conserve manpower when we need it most by lifting, lowering, pushing and supporting with greater safety.

Three sizes: No. 522, 5 ton; No. 310-A, 15 ton; No. 2030, 20 ton.

May be had at your field store.

Templeton, Kenly & Co.
Chicago, Illinois

Simplex Jacks
A better Jack for every job - many jobs for every Jack

Contractors

ty, Falcon-Seaboard 1 Moorehouse, C E½ SE SW 29-28-5w, 12 miles northwest of the Annes field, is progressing below 3,500 ft.

LOFFLAND BROTHERS Drilling Co., Tulsa, is moving rotary to southeastern Oklahoma County, Oklahoma, where contract has been obtained for Mid-Continent Petroleum Corp. et al 1 M. E. White, NE SE NW 35-12-1e, south of Harrah.

FLOYD B. FITCH, of Beattyville, Ky., was the contractor who drilled the well that added Virginia to the list of oil-producing states. The well, Eisel et al Fugate, was drilled south of the town of Rose Hill, in the southwestern part of Lee County, as reported in last week's issue of The Oil and Gas Journal.

R. E. PACE, president of Pace Drilling Co., has returned to his Wichita Falls offices from a business trip to Jackson and Hattiesburg, Miss., with an interesting incident to relate. Making the trip primarily to round up all the scrap metal on his oil and sawmill properties, he found the junk dealers too busy to buy his materials. Investigation revealed that the Government forces had moved in with railroad cars and loading crews to take over all scrap piles from hoarding junk dealers. After bringing his proposition to the attention of the proper authorities, Mr. Pace soon arranged a sale for his metal, including 6 miles of railroad track.

BENSON & OMOHUNDRO have set surface pipe on their wildcat being drilled 2 miles north of the Ringold field of Montague County, Texas. The test is known as 1 Staley, situated on a 40-acre lease in Blocks 62 and 67 of the Lindsly subdivision of Section 20, H.T.C.R. Survey. A number of oil companies, including Superior Oil Co. of California, hold an interest in the test.

HOUSTON Drilling Co., Houston, Tex., completed a 1,500-ft. east extension to the new South Ganado field, Jackson County, Texas. The extension is Gulfboard 2 Harmon, which is flowing pipe-line oil from the discovery pay at 5,300 ft.

JORDAN Drilling Co., Houston, Tex., has apparently opened Wilcox sand production in the Livingston field, Polk County, Texas, as the company's 1 Munson recovered pipeline oil on a drill-stem test in the upper Wilcox at 7,047 ft. The well is drilling ahead and is scheduled to go to a total depth below 8,500 ft., before casing is cemented for completion.

FITZPATRICK Drilling Co., Houston, Tex., this week drilled below 7,000 ft. in Tide Water 1 Gips, a wildcat 11 miles southwest of Yorktown, De Witt County, Texas, and promising showings have been logged in the Wilcox sand. Drill-stem testing is reported to have recovered some oil and salt water. The well is coring ahead.

FAIN Drilling Co., Houston, Tex., was preparing to retest Continental 1 Gabitsch, a wildcat in the Cistern area, Fayette County, Texas. This well showed for a producer in the upper Wilcox sand. Drill-stem test in sand at 2,800 ft. recovered pipe-line oil.

O. W. DYER, Houston, Tex., apparently opened a mile-north extension to the Mercy field, San Jacinto County, Texas. Casing was cemented on bottom at 8,311 ft. in Atlantic 1 Parker. Showings of oil and gas were logged in the Wilcox sand slightly lower than the discovery well. In the meantime drilling was started for the same company on another projected deep Wilcox test in the Neale field, Beauregard Parish.

ZEPHYR Drilling Co., Tulsa, has contract to start by June 10 drilling Mudge Oil Co. 1 D. E. New, A. Vanzela Survey, 4½ miles south of Mexia in Limestone County, Texas, latest in the series of wildcats in the area which are seeking shoreline traps in the Smackover section in the Tyler Woodbine basin.

PRINCE Brothers Drilling Co., Midland, Tex., received contract for the Falcon Oil Co. 1 Kiett, S. Benton Survey, 10 miles west of Currie, Tex., in Navarro County, a 6,500-ft. test to the Smackover lime, another in the current wildcat play.

CROSSE & JOHNSON, Odessa, Tex., contractors on the Mascho Oil Co. 1 Sun Oil-University, discovery well in Andrews County, West Texas, became half owners of the well on completion. The well will be given an 80-bbl. daily allowable for 12 months.

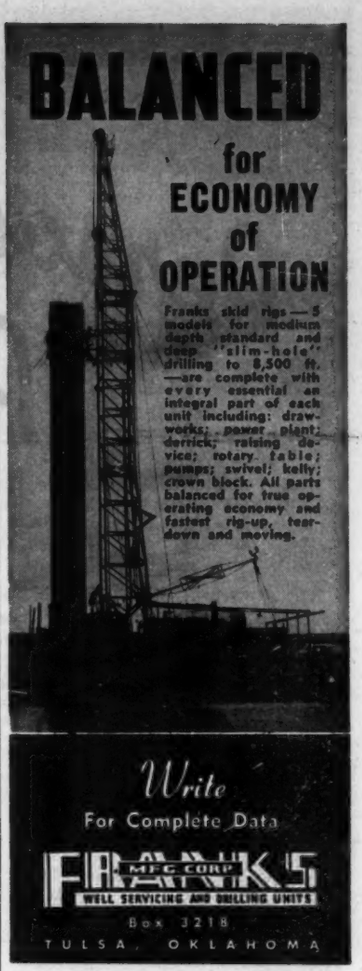
PAYNE Drilling Co., Tulsa, has the contract for Texas Co. 1 H. D. Stine, a 5,800-ft. test in Section 24, Block 4, H.&T.C. Survey, ½ mile east of the discovery well in the Spring pool of Clay County, Texas. It is the first operation in the pool for Texas Co.

DAVIDSON Drilling Co., Fort Worth, Tex., has the contract to drill Stanolind Oil & Gas Co. 1-V University, ½ mile north of the nearest Permian well in the West Andrews field of Andrews County, West Texas.

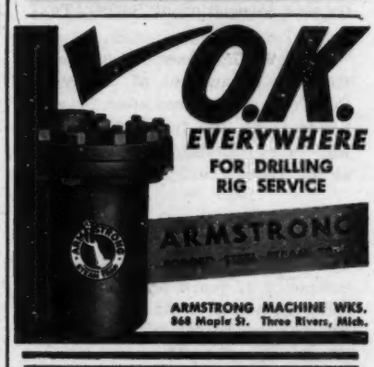
GARDNER Brothers, Dallas, Tex., have contracted to drill Texas Co. 1 J. B. Robertson, an Ordovician wildcat 9 miles south of the Seminole pool, NW NE Section 25, Block A-21, P.S.L. Survey, in Gaines County, West Texas. Derrick is up and water well is being drilled. The contract calls for drilling to 8,000 ft.

GEORGE LIVERMORE, Odessa, Tex., has the contract for Argo Oil 1 J. S. Nunn, a wildcat in the northwest part of Reagan County, West Texas, in Section 8, Block B, L.& S.F. Survey.

McCORD
Mechanical
LUBRICATORS
FOR SLUSH PUMP and DRILLING ENGINES
TYPE "SP"
Built to take it—to stand up under the extreme conditions of oil field service. You can depend on McCord "SP" lubricators to deliver oil in measured quantities without interruption. Specify McCord "SP".
For Sale by National Supply Company
Standard of the Oil Fields
McCORD
RADIATOR & MFG. CO.
DETROIT, MICHIGAN


BALANCED
for ECONOMY of OPERATION
Franks skid rigs—5 models for medium depth standard and deep "slim-hole" drilling to 8,500 ft.—are complete with every essential an integral part of each unit including: drawworks; power plant; derrick; raising device; rotary table; pumps; swivel; kelly; crown block. All parts balanced for true operating economy and fastest rig-up, teardown and moving.
Write For Complete Data
FRANKS MFG. CORP.
WELL SERVICING AND DRILLING UNITS
Box 3218
TULSA, OKLAHOMA

GATKE
DEEPWELL
WOVEN BRAKE LINING
The leader in sure action, easy feed-off, and low cost per ton mile.
GATKE CORPORATION
228 N. LaSalle St., CHICAGO



If you haven't had that FREE list of important oil books, by all means send your request to the Book Department, The Oil and Gas Journal, Tulsa, Oklahoma.

Personal Paragraphs

LEE THRONSON, formerly petroleum engineer for Sun Oil Co. at Corpus Christi, Tex., is now a second lieutenant in the 302d U. S. Army Ordnance.

NICK CARTER, of the Midland, Tex., office of Gulf Oil Corp., geological department, visited friends in Amarillo, Tex., last week. He then went to his old home at Waurika, Okla., for a few days before leaving for El Paso, Tex., to be inducted into the Army.

JOE GREER has been named acting deputy supervisor for District 3 of the Texas Railroad Commission with headquarters at Houston, Tex. Mr. Greer succeeds VAILE HENRY.

J. F. ADKISSON, JR., formerly division engineer for Sunray Oil Co. at Fort Worth, Tex., is now at Greenville, Tex., where he is principal engineering aid for the U. S. Engineers.

JOE CANNON, consulting geologist and independent oil operator at San Angelo, Tex., will continue his regular work instead of going into service with the Navy as he had previously expected.

R. F. HAMILTON, secretary to the executive committee of Phillips Petroleum Co., Bartlesville, Okla., was among the speakers at a meeting of the Panhandle Producers & Royalty Owners Association at Borger, Tex.

O. A. WISE, a member of the accounting department of Carter Oil Co., Tulsa, has retired after 23 years' service with the firm. Members of the force honored him at a party at the Wise home.

J. S. GALLAGHER, a member of the refining department of Texas Co. in Los Angeles, Calif., recently completed 27 years' service with the company and in point of service has not been exceeded by very many of the employes of the California division.

JOHN P. MANSFIELD, for 45 years associated with United Natural Gas Co., has been retired by the company. More than 100 officials and employes of the company honored him at a testimonial dinner at Oil City, Pa., last week. GEORGE E. WELKER, president of the company, addressed the assembly.

RALPH ERWIN, assistant chief of Shell Oil Co., Inc.'s land department division at Wichita Falls, Tex., has been commissioned an ensign and will report to the naval base at San Francisco on June 15.

HARRY D. BROOKBY, geologist for Phillips Petroleum Co. at Wichita Falls, Tex., has been commissioned an ensign in the Navy and is leaving immediately for Notre Dame University for a 6 weeks' course of study prior to sea duty.

IRVING J. HANCOCK, assistant controller of Union Oil Co. of California, Los Angeles, was elected president of the Petroleum Accountants Society, Los Angeles, at a meeting of the society's board of directors on June 2. Other officers are N. JAMES ALLEN, first vice president; CHARLES K. SLACK, General Petroleum Corp., second vice president, and STANLEY J. ANDERSON, Ring Oil Co., secretary-treasurer. Mr. Hancock has lived in Los Angeles for 39 years, and enjoys a reputation as a barbecuer and as a color phdtographer. He succeeds D. A. MOORE, Wilshire Oil Co., as president of the society.

IRVING J. HANCOCK

JOHN CODY, general superintendent in the Gulf Coast division for the Superior Oil Co. of California, Houston, Tex., has been transferred to the company's offices at Los Angeles, Calif., as general superintendent. W. S. LAW succeeds Mr. Cody as Gulf Coast general superintendent.

Do You Remember?

From The Oil and Gas Journal Files

35 YEARS AGO

The Glenn pool, of Oklahoma, is at flood tide with a production in excess of 118,000 bbl. a day. There are now nearly 500 producing wells in the Glenn district and new ones are being completed at the rate of three a day.

Tulsa is rapidly assuming the appearance of a hustling city. A big step forward was made early this month when street car service was inaugurated. New buildings are going up all over the city, and hotels are hanging out the "full-up" sign every night.

25 YEARS AGO

Secretary McAdoo of the Treasury Department, intimates that he will increase the revenue by $75,000,000 by special taxes on oil during this year.

Forty derricks were blown down at Drumright, Okla., on June 8, all the property of Gypsy Oil Co. Several buildings were also destroyed, but fortunately there was no loss of life.

The increased cost of casing in Kansas has stopped the drilling of a number of wells. As a result of the stoppage of work the price of crude oil at the well will be doubled within the next 6 months, it is asserted.

15 YEARS AGO

The executive board of the American Gas Association has unanimously approved the merger with the Natural Gas Association of America. President N. C. McGowen of the latter association, is slated to become chairman of the managing committee of the natural-gas department of the American Gas Association.

The name of Ennis-Bayard Petroleum Co. has been changed to the Bayard Petroleum Co. Harry Bayard, who has been sole manager since Mr. Ennis' retirement, organized the new company and remains at its head.

The Texas-Mexican Oil & Refining Co., Laredo, Tex., has elected Miles T. Cogley as its new president, and he will be in charge of refinery operations. Further enlargement of the company is planned.

B. F. ROBBINS, Big Spring, Tex., oil and lease operator, has been elected president of the Southwestern Royalty Co.

GOLDWIN E. G. LIESEMER, Calgary, Alta., has been appointed assessor under the Oil and Gas Resources Conservation Act, for Alberta.

JOHN F. PATERSON, commissioned and assigned to construction work for the U. S. Army, was formerly district superintendent for Phillips Petroleum Co. at League City, Tex.

ELLIS C. BEEGLE, Clarion, Pa., oil man, was elected president of the Associated Petroleum Industries in Pennsylvania at a recent meeting of the group. Vice chairman is W. K. MOWRY, and EARL SHAY is secretary.

FRANK E. ESTERLIN, who has been technical assistant in the chemical division of Shell Oil Co., Inc.'s Dominguez, Calif., refinery, has been appointed manager of the distilling department and transferred to the company's Wilmington refinery.

Members of the Permian Basin Engineers Association were entertained at a dinner meeting in the Crystal Ballroom of the Scharbauer Hotel in Midland, Tex., last week, where they heard E. A. WAHLSTROM report on the activities of the war effort committee.

HY BYRD, who has charge of the New York office of Phillips Petroleum Co., last week was elected vice president of the company. C. R. MUSGRAVE, Bartlesville, Okla., vice president in charge of transportation, was elected a director and member of the executive committee.

C. C. HERNDON, vice president of Skelly Oil Co., has returned to his home in Tulsa after a lengthy stay in Washington, D. C., for his company.

JOHN C. JOHNSON, geologist for Stanolind Oil & Gas Co., in Shawnee, Okla., has received his commission as ensign in the U. S. Navy, and will report for duty on July 1. He has been in the Shawnee office of Stanolind for 2½ years.

CARL DUNLAP, formerly draftsman for Hagy, Harrington & Marsh, at Amarillo, Tex., has accepted a similar position with Hycar Chemical Co., and has moved to Bartlesville, Okla., headquarters of the company.

FRANK G. EVANS, research geologist for Shell Oil Co., Inc., at Houston, Tex., gave an illustrated talk on "Interpretation of Aerial Photographs" at this week's meeting of the Houston section of the American Institute of Mining and Metallurgical Engineers.

F. C. MECHIN has been appointed director of protection of petroleum reserves for Canada. Mr. Mechin has long been attached to the staff of SIR ALEXANDER GIBBS, chief engineer of the British Admiralty, as engineer in charge of pipe lines and tankage.

CLAYTON C. BRINKLEY, assistant engineer of the Eldred, Pa., compressor station of United Natural Gas Co., has been retired by the company after 31 years of employment. Mr. Brinkley lived at Sigel, Pa., and began his service as utility man in the Sigel field in 1910.

R. E. ST. CLAIR, safety engineer of Panhandle Oil & Refining Co., Wichita Falls, Tex., has been named a member of the executive committee of the industrial section of the Texas Safety Association, to serve for the fiscal year. The organization will attempt to speed up accident prevention among workers in war plants.

Experienced for Job

More than a quarter century of experience in the two industries qualify E. Holley Poe for the important post of director of the Natural Gas and Natural Gasoline Division of the Office of Petroleum Coordinator for War.

His appointment as chief of the recently created division in OPC was confirmed this week at Washington, D. C., where he has spent much time since outbreak of the war. Previously, the natural-gas and natural-gasoline industries occupied a subordinate niche in the OPC organization as a section of the Division of Production. (See related story in News Section of this issue.)

E. HOLLEY POE

Since the middle of 1937, Mr. Poe had been secretary of the Natural Gas Section, American Gas Association, New York, a position he resigned to accept the OPC appointment.

In 1918, Mr. Poe joined the Tidal Oil Co., after being 2 years with Slick Oil Co. and Sinclair Oil Co. Two years later, he became associated with Tiger Mountain Oil Co., and its subsidiary, the Henryetta Gas Co., Tulsa, where he was in charge of natural-gas and natural-gasoline operations. When the Henryetta Gas Co. was purchased by the Central States Power & Light Co., in 1927, Mr. Poe continued with the organization in which he rose to the post of assistant general manager. He remained with Central States, which is now a part of Oklahoma Natural Gas Co., until 1937 when he became secretary of the trade association.

Mr. Poe was born in Pawnee, Oklahoma Territory. He passed his boyhood in Tulsa and attended Tulsa schools and Morgan School in Fayetteville, Tenn. Vacations were spent working in oil and gas fields, starting with a shovel in the Bird Creek field of Oklahoma. For 2 years he studied law in the office of his father in Tulsa.

EDMOND A. COBB, formerly natural-gas engineer in Sun Oil Co.'s Dallas headquarters, has been commissioned a captain in Army Air Corps.

STEPHEN P. GARDNER, formerly a production engineer for Sun Oil Co. at McAllen, Tex., is now an ensign at Great Lakes Naval Training Base.

J. D. CORDOZA, who has been district sales manager for Tide Water Associated Oil Co. at Salt Lake City, Utah, has been appointed assistant to E. C. HEINZ, district sales manager of the Los Angeles, Calif., area.

GUY N. TOMKINS, who is a former employe of Hunt Oil Co., Palestine, Tex., and who reported for Army duty more than a year ago, has been promoted to the rank of captain in the Quartermaster Corps, Kelly Field, San Antonio, Tex.

DEE E. HUMPHREY, independent operator of Dallas, Tex., has proposed that the business interests of Texas join in a meeting to petition the assembly of the legislature for "the purpose of reducing the flow of our natural gas to other states and to curb the waste of gas burned in flares."

J. G. WARD, Parkersburg, W. Va., was elected director of South Penn Oil Co., Pittsburgh, Pa., last week, to fill the unexpired term of JOHN E. SELDEN, who entered the Army on May 26. Mr. Ward has been with South Penn since 1898, and is now vice president of South Penn Natural Gas Co.

A group of officials of Shell Oil Co., Inc., made an inspection tour last week of the Permian basin area. Included were: A. J. GALLOWAY, Houston, Tex., vice president of the Southwestern division; H. BLOEMGARTEN, New York City, president of the Eastern division; R. B. ROARK, Tulsa, vice president, Oklahoma division, and E. G. ROBINSON, Centralia, Ill., general manager of the Illinois division.

Shifts: R. C. ROETHER, superintendent, Gulf Oil Corp., Lansdowne to Drexel Hill, Pa.; J. C. HUNTER, superintendent, Falcon-Seaboard Drilling Co., Weston to New Martinsville, W. Va.; R. C. KERR, engineer, Standard Oil Co. of California, Lansing, Mich., to New Orleans, La.; DICK FEAGAN, engineer, Stanolind Oil & Gas Co., Austin to Hamlin, Tex.; F. S. WEST, engineer, Texas Co., Long Beach, Calif., to Houston, Tex.; C. B. SWAIN, JR., engineer, Humble Oil & Refining Co., Wink, Tex., to Hobbs, N. M.; E. I. HEAD, engineer, Gulf Oil Corp, Lubbock to Fort Stockton, Tex.; VAUGHN W. RUSSOM, geologist, Sinclair Prairie Oil Co., Hobart, Okla., to Bismarck, N. D.; JAMES MODRALL, engineer, Texas Co., Tulsa to Seminole, Okla.; R. R. EMERY, superintendent, Halliburton Oil Well Cementing Co., Casper, Wyo., to Wichita, Kans.; H. D. DICKSON, engineer, Humble Oil & Refining Co., Midland to Houston, Tex.; I. B. LOYD, engineer, Texas Co., Kinsley, Kans., to Bismarck, N. D.; R. L. WALES, engineer, Texas Co., Carbondale, Ill. to Spencer, W. Va.; CARL W. BLACKEY, engineer, Seismograph Service Corp., Hobbs, N. M., to Stanton, Tex.

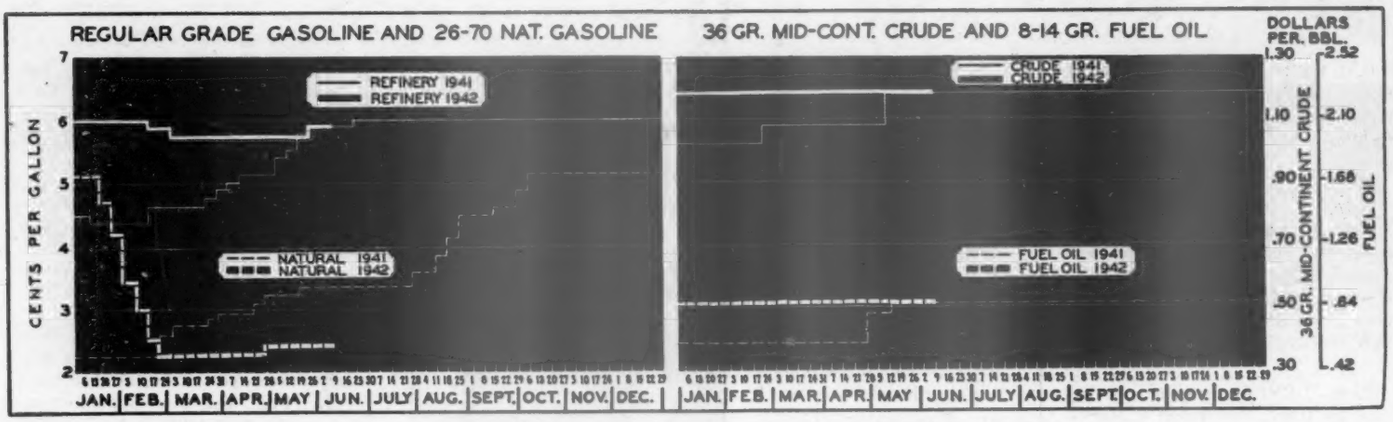
W. A. SCHAEFFER, assistant to the president, Shell Oil Co., Inc., Houston, Tex., has been appointed chief exploitation engineer. He succeeds W. A. ALEXANDER, who has been appointed assistant production manager to succeed P. L. GUARIN, who recently joined the Engineers Corps as major in the U. S. Army.

HAROLD McCLURE, of Alma, Mich., independent oil operator, has been reelected chairman of the Michigan Oil Advisory Board, a post he has held since creation of the board in 1939. He is also legislative secretary of the Michigan Oil and Gas Association. W. P. CLARKE, Gulf Refining Co. geologist of Saginaw, has been retained as advisory board chairman.

HARRY B. LITTLE, formerly civil engineer for Sun Oil Co. at McAllen, Tex., is now supervising engineering work in the Navy.

C. J. KERWIN, division superintendent for British American Oil Producing Co. at Wichita Falls, Tex., has returned from a 2-week business trip in Wyoming, where his company recently completed a producer near Riverton. The well was a joint enterprise with Superior Oil Co., and Superior has since started drilling at a second location.

J. M. WANENMACHER, formerly division exploitation engineer for Shell Oil Co., Inc., at Wichita Falls, Tex., has been placed in charge of the special subsurface section recently organized at the company's Tulsa offices. Mr. Wanenmacher's former position has been taken by FRANK LEACH, who was formerly division exploitation engineer at Wichita, Kans.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK. — Oil companies participating in the tank-car pool supplying the East Coast area are preparing a new brief for submission to the Office of Price Administration in the hope of obtaining additional price increases to offset to some extent the tremendous costs incurred by them in resorting to rail shipments. The last advance was allowed April 29 and since then tank car shipments have risen almost 100,000 bbl. per day with a corresponding increase in over-all costs. These costs have completely wiped out the profits of companies operating exclusively in the rationed territory and have greatly impaired those of companies marketing in a broader area. Increased costs resulting from the use of tank-car transportation alone are reported to run approximately $3,500,000 per month for one company while they range down to several hundred thousand dollars for some distributors.

The announcement of the new rationing plans to take effect July 1 evoked an outburst of protest from eastern gasoline dealers. Spokesmen for the Eastern States Gasoline Dealers Association claimed that it would result in a 4-cent advance in retail prices and charged the plan is a "deliberate and planned freeze-out for thousands of small business men." Numerous stations have already been closed throughout the East and the reduced volume of business is certain to close many others.

The supply situation continued tight with respect to all major products. Even with the 50 per cent restriction in service-station deliveries, gasoline quotas in the majority of instances are exhausted. Despite the absence of consumer demand for heating oils, their situation is also tight as distributors vainly seek to stock up for fall and winter delivery. Due in part to conversion, essential demands for heavy fuel oil are being met but a further increase in deliveries will be needed to meet later requirements.

Mid-Continent

FIRM demand for motor gasoline and all grades of kerosene featured this week's refinery market. Gasoline requirements are reflecting seasonal influences. And, while gallonage is not moving higher as abruptly or to the same extent as a year ago, the warmer weather and longer trips are a factor of considerable significance.

Furthermore, motor-fuel consumption by certain types of industry is reported to be higher than ever before. This condition exists particularly in the transport of raw materials to war factories and distribution of finished armaments and assembly parts from central plants to secondary depots and to disseminated plants where finishing operations are completed.

SENTENCE SUMMARIES

MID-CONTINENT: Kerosene and tractor fuels particularly active. Demand for motor fuel on firm basis. Distress offerings limited.

GULF COAST: Adjustment of refinery operations as directed by OPC may tend to firm general tone. Some movement in evidence against lend-lease contracts.

EAST COAST: Reported liberalization of rationing clouds outlook for long-term supplies. Deliveries lag behind minimum requirements.

PENNSYLVANIA: Motor-fuel stocks diminished at most western Pennsylvania refineries, reflecting higher shipments to seaboard terminals.

PACIFIC COAST: All products, excepting residual fuel oil, trading without feature. Demand for heavy fuels is brisk and growing.

Kerosene and tractor fuels are in especially strong demand from the agricultural districts of the Middle West. Most farmers are preparing to harvest bumper crops in the fall and some of the current demand for quality distillates is representative of forward buying from rural customers.

Service stations catering exclusively to pleasure drivers, or those whose business is predominantly with this class of automobile operator, report that gallonage, while running ahead of the first quarter this year, is considerably under gallonage averages in mid-June 1941.

A.P.I. REFINERY REPORT

Week Ended May 30, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
Appalachian	159	3,422	620	446
Ind., Ill., Ky.	778	19,294	3,091	2,759
Okla., Kans., Mo.	360	8,893	1,615	1,069
Censored area*	1,519	44,020	16,882	15,024
Rockies	90	2,530	572	325
California	616	17,196	56,848	11,761
Total May 30, 1942	**3,522**	**95,355**	**79,628**	**31,384**
Total May 23, 1942	**3,393**	**97,034**	**79,442**	**30,814**
Total May 31, 1941	**3,759**	**93,156**	**91,370**	**35,373**

Note: Refinery runs and stocks for week ended June 6, 1942, appear on Trends page.

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended:	Bbl. of crude*
Week ended:	Bbl. of crude*
May 30, 1942	255,023,000
May 23, 1942	253,423,000
May 31, 1942	282,356,000

*Excludes heavy, unrefinable stocks in California.

Threatened increase in the inconvenience in distribution of Mid-Continent refinery products is apparently temporarily delayed by diversion of tank cars from the Pacific Coast to serve the eastern shortage area. Previously, the OPC and ODT had considered the possibility of removing additional cars from the Middle West, siphoning off about 20 per cent of the cars remaining in this area.

Decision to transfer the cars from the Pacific Coast, a move made possible by resumption of limited tanker service along the California coast line, will possibly relieve the Middle West railroad shippers from this obligation.

Residual fuel oil is absorbed to the limits of current production by inland refineries. Considerable movement of heavy fuels to eastern areas is continuing and contract customers in the Middle West, particularly the railroads, are calling for maximum quantities specified in their agreements with refiners.

Natural gasoline in Oklahoma (Group 3) is under active call at the previous level of 2.375 cents per gallon for 26-70 material. Demand is running slightly ahead of current production but distress material in the North Texas market is acting as a check on Mid-Continent prices. Movement to the Gulf Coast is sporadic and unpredictable because most of the spot demand develops with arrival of convoys about which no advance information is obtainable.

Pacific Coast

LOS ANGELES, Calif.—The general market was quiet this week but a little distress gasoline made its appearance and caused a weakening in the market but did not change the going price in the spot market. The spot market in California is becoming of less importance with the expiration of each week as very little gasoline is moving.

Fuel-oil demand continues good and is expected to be increased within the next several months. Fuel-oil and heavy crude-oil stocks have been reduced consistently for the past 2 years and have reached the lowest level attained since 1929.

Diesel and gas-oil demand appears to be increasing reflecting the use of these commodities as blending agents with residual fuels.

Natural gasoline has not shown the firmness expected to result from increased use in the manufacture of butane and isobutane for war materials but this may later become a factor. In May the Ventura Avenue and Kettleman North Dome fields were given increased allowables in order to step up the production of isobutane. It is believed that both fields soon will be reduced from their top May production. The L.P.G. industry has not yet felt the full effect of the war program but will soon as orders have been issued to reduce the butane content.

REFINERY AND TANK-WAGON PRICES

(Prices as of June 9)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	.....	5.625-5.750	.....	5.250-5.375	4.875-5.000
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast	9.700	.....	.....	9.200	9.200	.....	.....
Pacific Coast	.....	6.500-6.750	6.125-6.250	6.250-6.500	5.750-6.250	5.25-5.50	4750-5.000

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	2.375	2.750-2.875	.....
North Texas	2.000	2.375-2.500	.....
North Louisiana	2.125	2.500-2.625	.....
California	.....	.....	5.000-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500-4.750	4.375-4.625	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-6.000	4.500
Northeast Coast	.....	.....	.....	5.700	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	‡$1.35-1.45	$0.85-0.90
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast.	.....	.....	.....	5.800	2.222	1.80
North Louisiana.	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.500-3.625	3.375-3.500	$0.85	$0.85
Pennsylvania (West)	5.625-5.875	5.375-5.875	†5.250-5.500	.....
Northeast Coast	5.8	5.8	1.85	1.80
Pacific Coast	5.5	5.5	‡0.80-95	$0.80
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

	Bright and Steam Refined	Neutral Oil
OKLAHOMA (Group 3)—		
200-210 D, 10-25	27.00	
150-160 D, 0-10	23.00	
120-125 D, 0-10	22.90	
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point	30.50	
15 pour point	29.50	
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

	Neutral Oil	
CALIFORNIA		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		38.50
10 pour point		37.50
15 pour point		36.50
25 pour point		31.00
200 vis., at 70° F., 3 color:		
Zero pour point		40.50
10 pour point		39.50
15 pour point		38.50
25 pour point		33.00

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250
NEW YORK— Wax in bags fully refined:	
130-132 (A.m.p.) wax	6.250
133-135 (A.m.p.) wax	6.550
Crude scale:	
124-126 (A.m.p.) w.s.	4.350-4.455
124-126 (A.m.p.) y.s.	4.350-4.455

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	.....	....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8	....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	15.05	5.50	9.10
Boston, Mass.	14.50	4.50	8.40
Burlington, Vt.	16.50	5.50	....
Buffalo, N. Y.	15.80	5.50	9.20
Dover, Del.	16.30	5.50	10.80
Hartford, Conn.	15.20	4.50	....
Manchester, N. H.	16.90	5.50	9.40
Newark, N. J.	14.30	4.50	8.30
New York, N. Y.	15.70	5.50	8.40
Philadelphia, Pa.	15.80	5.50	10.55
Pittsburgh, Pa.	16.30	5.50	10.90
Portland, Me.	15.90	5.50	8.50
Providence, R. I.	14.60	4.50	8.20
Washington, D. C.	14.30	3.50	9.60
Average 14 cities	15.51	5.07	9.28

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.03	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	19.00	7.50	9.40
Birmingham, Ala.	19.60	8.50	9.00
Charleston, S. C.	18.55	7.50	....
Charleston, W. Va.	18.85	6.50	11.90
Charlotte, N. C.	19.70	7.50	9.90
Jacksonville, Fla.	19.00	8.50	8.40
Jackson, Miss.	18.00	7.50	8.50
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.25	8.50	*10.00
Norfolk, Va.	17.05	6.50	10.60
Average 11 cities	18.34	7.59	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.53	5.96	10.30
Average last week	16.57	5.96	10.30

Canadian Fields

(Continued from Page 81)

has cleaned out bridge and is bailing around 60 bbl. daily with oil standing 800 ft. in the hole. Midfield Petroleum 1, LSD 6, 14-50-6w4, finished a dry hole below 1,600 ft. Fuel-oil shipments from the Borrodaile refinery now run 360 bbl. daily, with 30 bbl. additional from various wells, and there is considerable crude accumulating in storage.

In the Tilley field, eastern Alberta, Northwest Co. 2, LSD 4, 17-17-12w4, is producing around 40 bbl. daily, with water varying from 15 to 25 per cent. Northwest 3, LSD 13, 17-16-12w4, finished at 3,206 ft., is gun perforating and testing. Northwest 5, LSD 3, 17-17-12w4, has spudded.

Lake Drilling Planned

West Petroleum, Ltd., of Toronto, headed by D. R. Michener, has applied to the federal Public Works Department for permission to construct piers to be used in connection with the drilling of two wells in the bed of Lake Erie. Locations are opposite Lots 183 and 184, Talbot Road, Romney Township, and 2,990 ft. from high-water mark. Previous wells drilled in the lake bed opposite the old Romney-Tilbury gas field have been relatively close to shore.

Crude-Oil Prices

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	3.00

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas*
18-18.9	$0.80	.....	.....	.....
19-19.9	.84	.....	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.02
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.06
38-38.9	....	1.21	1.44	1.08
39-39.9	....	1.23	1.46	1.10
40 and above	....	1.25	1.48	1.12

*Includes Lea County, New Mexico.

EQUIPMENT PROGRESS...

Navy Again Honors Bantam Bearings for War Work

For the second time in 6 months the Navy has expressed appreciation to employes and management of Bantam Bearings Corp., South Bend, Ind., for an

outstanding production record on work being done for the Navy by awarding the corporation the coveted "E" for excellence pennant with white star and fouled anchor, symbolic of an outstanding production record since the firm received an "E" pennant 6 months ago.

Lt. Kenneth Keepers and Ensign E. C. Dollard presented the award as representatives of the ninth naval district.

In accepting the award on behalf of Bantam, R. B. Nichols, vice president and general manager, said, "This citation from the Navy Department is further evidence that our employes are keeping their promise to go all out for the war effort. Since the first "E" award was made we have been able to step up production in a marked degree, and I'm sure every man is ready to try again to better our record."

An additional white star can be added every 6 months that the company maintains its splendid production record. Bantam Bearings Corp. was among the first to receive the original Navy "E" award and is one of four in the Midwest to receive the additional star and fouled anchor pennant.

TRADE LITERATURE

OLIVER UNITED FILTERS, 33 West Forty-second Street, New York City.—Folder on the Oliver Diaphragm Slurry Pump. The folder, Bulletin 307-R, has a diagrammatic sketch of the pump, with sketches showing recommended hookups. The back page presents compressed air, vacuum and power requirements, and conversion table.

UNITED STATES RUBBER CO., Akron, Ohio.—A 48-page illustrated book on conservation of rubber products in industry. Complete and explicit suggestions are given for proper care of these important rubber products from initial design through inventory and storage to use, maintenance, inspection and repair. The book, "First Aid to Industry in Conserving Rubber, is completely indexed and all mechanical rubber goods are included.

UNITED STATES STONEWARE CO., Akron, Ohio.—Bulletin 1700, describing a new line of Republic lead coatings. The booklet contains much that is new on the subject of homogeneous lead linings. It is copiously illustrated, with both photographic and diagrammatic illustrations.

JOHNS-MANVILLE, 22 East Fortieth Street, New York City.—Manual on repair of war-damaged pipe. This 92-page engineering manual treats on the repair of distribution and disposal lines, as well as water mains, damaged by enemy action. It is designed to provide the detailed information necessary to officials for the maintenance of service in the oil industry, as well as cities, at military flying fields, bases and other critical areas vulnerable to bombing attacks. It is offered without charge to plant engineers, consulting engineers, Army and Navy engineers and others.

KEYSTONE DRILLER CO., Beaver Falls, Pa.—Bulletin on Series 80 Deep Well Spudders, which are particularly adapted for oil-well drilling. Also bulletin on the Keystone 60 Model, the well drill with belt-driven crank and chain hoist. Both of these are eight-page bulletins, profusely illustrated.

ALLIED STEEL PRODUCTS CORP., Tulsa.—New catalog, No. 42, showing complete line of sectional steel buildings, sheet-metal fabrication, steel grating, structural-steel fabrication, tool houses, and ventilators.

Ryerson to Stock New (NE) National Emergency Alloy Steels

Joseph T. Ryerson & Son, Inc., announce the addition of the new NE (National Emergency) alloy steels to their warehouse stocks. NE alloys are "lean" alloy steels established by the metallurgical staff of the War Production Board to help conserve nickel, chromium, vanadium, etc., for the duration. To make these new alloys quickly available, Ryerson has planned a representative stock of hot rolled rounds in sizes ranging from ½ to 7 in. in diameter and in six different analyses. Heretofore, these new steels have not been available for experimentation and it has been difficult to secure even small lots necessary for determining the suitability of the steels for an application. Now, manufacturers can get small lots for treating and testing in specific applications. This method will assure proper selection of steels, which can then be ordered confidently in production quantities.

Exact distribution among the Ryerson plants is not yet decided, but initial stocks will consist of six analyses: (1) carburizing alloys, N1 4023 and NE 8620; (2) medium hardening alloys, NE 4042 and NE 8744; (3) high hardening alloys, NE 4047 and NE 8749. It is confidently believed that these new alloys, properly selected and heat treated, will satisfactorily replace the higher alloy content steels formerly used, except in very special applications.

Carburizing grade		Medium hardening grade		High hardening grade	
NE alloy steels	Replace A.I.S.I. &S.A.E.	NE alloy steels	Replace A.I.S.I. &S.A.E.	NE alloy steels	Replace A.I.S.I. &S.A.E.
NE 4023 NE 8620	2300 2500 3100 4100 4600 5100 6100	NE 4042 NE 8744	2330-35 3130-35 4130-35 5130-35 6130-35	NE 4047 NE 8749	2300 3100 3200 4100 4600 6100

In order to develop "lean" alloy steels all research records were carefully examined. The War Production Board put the best metallurgical brains in the country to work on the problem. The outcome was the creation of a number of analyses now called NE (National Emergency) steels.

The metallurgical section of the WPB is very desirous of knowing how the new NE steels will do the job and conserve scarce metals. Therefore, all users are urgently requested to report details of each operation such as forging, machining, heat-treatment response, tool life, as well as the results of tests, etc., so that this information can be made available to others.

While at the present time only limited heat treating data are on hand, Ryerson will furnish all possible information with each order to give users as much help as possible.

Two New Flame Cutting Tips Announced by Airco

Two additions to their line of oxyacetylene flame cutting tips have just been announced by Air Reduction, 60 East Forty-second Street, New York City. The first, known as Style 108, is ideal for working in close quarters. It is bent in an offset shape to permit cutting along a line 21/32-in. from the vertical center line of the torch head or barrel. This offset design meets the problem of cutting close to bulkheads, flanges or shoulders where the radius of the torch head would prevent alignment of the cutting orifice vertically over the desired line of cut.

The Style 108 tip has milled flat sides, with two preheat flames, and is suitable for either machine or hand-cutting operations. It is available at present in sizes Nos. 1 to 3, for cutting steel up to 1½ in. thick.

The other new addition to the line is the Style 139 straight tip with one preheat orifice, for certain machine or hand-cutting operations. This is a companion tip to the recently announced Style 119, which carries two preheat orifices. Made in sizes Nos. 0 to 3, Style 138 is particularly adapted to splitting angle iron, straight-line cutting using a straight edge as a guide, or sheet metal cutting operations, in which light preheat is desired.

BJ Offers a New 300-Ton Elevator

To meet the increasing demand for an elevator to handle the longest, heaviest strings of 90° shoulder-type drill pipe, there is now available the BJ Type AA elevator having a rated capacity of 300 tons, with a

safety factor of four based upon the ultimate strength of the material.

The entire body of this new elevator is heat-treated to withstand the terrific pounding effect of tool joints contacted at high speed when modern heavy-duty equipment is used.

All the basic features of the popular BJ Center Latch elevators are present in this 300-ton model: the body is constructed in two halves of practically the same weight for proper balance and ease in opening or closing; the narrow width under the elevator trunnions permit the "Perfection Bend" on BJ weldless links to direct the lift under the tool joint or collar and minimize bending stresses; the long operating handles provide a man-size grip, with guards to keep the hands of the operator away from danger; curved link blocks allow greater freedom of the elevator links when operating the elevator, and these blocks are securely bolted to retain the links safely.

A successful, new latch lock holds the Type AA elevator latch closed and locked against accidental opening due to impact in the horizontal plane. Other details are available from Byron Jackson Co., Houston, Los Angeles, or New York.

Announce New Blackmer Pumping Unit

A combination rotary-centrifugal dual pumping unit has been added to the Blackmer line of pumps, according to an announcement by J. B. Trotman, general sales manager of the Blackmer Pump Co., Grand Rapids, Mich.

The new unit is mounted on a cast bedplate and is powered by a 4-hp., three-phase, 60-cycle motor with a gearhead on one end to drive a rotary pumping unit, and a shaft extension on the other end, connected direct to a centrifugal pump.

In applications where pumping facilities for both lube or fuel oil and water are required, these new Blackmer units offer many advantages.

For information and detailed specifications concerning the new pump, write J. B. Trotman, Blackmer Pump Co., Grand Rapids, Mich.

Don Leach to Supervise Federal Project

D. A. Leach, for many years Mid-Continent representative for the Chicago Bridge & Iron Co., has temporarily moved his office and family from Tulsa to Ottawa, Ill., near where he has been placed in charge of a large federal ship-construction project. Mr. Leach left early Monday with his family and expects to be away at least a year. His stay in Tulsa this week was just long enough to arrange the transfer of the family for he has been handling the work from the Chicago offices of his company for more than a month.

Spain and McDonald Are Promoted by Caterpillar

Appointment of Gail E. Spain to the position of vice president and the promotion of John Q. McDonald to general sales manager, are announced by Caterpillar Tractor Co., Peoria, Ill.

G. E. SPAIN

J. Q. McDONALD

Mr. Spain, who has been general sales manager since November, 1940, succeeds the late D. G. Sherwin and will move to Caterpillar's San Leandro, Calif., office to direct activities there and coordinate operations with those in Peoria.

Mr. Spain is a native of Portland, Ore. He was graduated from Oregon State College in 1920 with the degree of mechanical engineer.

After his graduation, Mr. Spain joined the Willamette Iron & Steel Works at Portland and spent 9 years with that organization in the sales and engineering departments. For 2 years before coming to Caterpillar, he was Willamette's sales manager.

Mr. Spain joined Caterpillar Tractor Co. at San Leandro in 1929 and was transferred to Peoria the same year. He has held, progressively, the positions of logging representative, assistant manager merchandise department, assistant manager engine sales division, assistant sales manager, manager sales development division and general sales manager. He also served 1 year with Sullivan Machinery Co. as general manager of the rock handling division.

Mr. McDonald has served as export sales manager since May 1940. A native of Lompoc, Calif., and a graduate of the University of California, he served throughout World War I commissioned as a pilot in the U. S. Army Aviation Corps. In 1927 he joined Caterpillar as supervisor of agricultural sales for the western United States and the western part of Canada. In 1929 he went to Europe to study the applications of Caterpillar track-type tractors in Russia. Returning to this country in 1930, Mr. McDonald served for 4 years as district representative for the company in various parts of the country. In 1934 he became district representative in London and countries in northern Europe, returning 2 years later to Peoria to serve as export sales supervisor and assistant export sales manager before his promotion to export sales manager.

J. D. Fletcher, vice president, will take over the active direction of export sales in addition to his duties as head of the export department.

The board of directors of Caterpillar, besides elevating Mr. Spain to a vice presidency, placed on the board C. O. G. Miller, of San Francisco, Calif., to fill the vacancy left by the recent death of John A. McGregor. Mr. Miller is a director also of the Pacific Gas & Electric Co., Pacific Lighting Corp., Soundview Pulp & Paper Co. and Coos Bay Lumber Co.

AMONG EQUIPMENT MEN...

Craine Heads American's Texas Gulf Coast Division

R. E. (Bob) Craine, who has been associated with American Iron & Machine Works Co. for almost 20 years, has been made district manager of the Texas Gulf Coast division, with headquarters in Houston, Tex., effective June 1. Mr. Craine was formerly manager of the company's shops in East Texas, Oklahoma and Kansas, and enjoys a wide acquaintance with oil men all over the Southwest. He has the reputation of being one of the best repairmen in the oil business.

Simmons Placed in Charge Of Franks' Fort Worth Office

Clair C. Simmons, who took his first "real job" with Franks Manufacturing Corp., over 8 years ago, has been placed in charge of the Fort Worth, Tex., branch office of Franks, to succeed R. N. White, who has been called to Washington temporarily.

CLAIR C. SIMMONS

Mr. Simmons went to work for Franks in January 1934, doing shop work and operating a drill press. In a short time, he had operated every machine in the shop. In 1936, he began 2 years as a service man, and in 1938 he began his experience as a roughneck, working for Shell Oil Co., Inc., at Big Spring, Tex.

In January 1940, Mr. Simmons was transferred to the Odessa, Tex., office of Franks where he opened and operated the first branch parts warehouse and service department in the company's history. This spring, he assumed managership of the Fort Worth office.

He is married, has two children, and in his own words, "likes to fish and hunt, but never finds time to do either.

Walter Geist Elected President Of Allis-Chalmers

Max W. Babb, board chairman of the Allis-Chalmers Manufacturing Co., has announced that Walter Geist was elected president of the company at a meeting of the board of directors held in Milwaukee on May 7. In this capacity Mr. Geist will replace W. C. Buchanan, whose resignation was forced by ill health a few weeks ago.

In April of this year, Mr. Geist was made executive vice president by the board of directors, and, today, 1 month later, has been made president.

In July of last year, Mr. Geist was appointed to the committee on economical policy of the National Association of Manufacturers, and also to the resolutions committee; while last December he was elected a director of York Ice Machinery Co., York, Pa. Allis-Chalmers compressors are widely used on York ice machinery and Mr. Geist's advice on technical matters is frequently sought by this firm.

Preston at Hobbs, N. M., for DeHydro

W. A. (Bill) Preston is now situated at Hobbs, N. M., as service representative for the DeHydro Co. in the New Mexico-West Texas district. Bill Preston is widely known among oil-treating men in the industry and is particularly qualified to act as DeHydro engineer in his new assignment. During the last several years he has been representing the DeHydro Co. at Hutchinson, Kans. A few months ago he was transferred into the Tulsa office to assist in some special laboratory work, where he served until his new apopintment in the New Mexico-West Texas district.

Griffith Named Superintendent Of Baroid Service

A. N. Griffith, Baroid Sales Division, has been made superintendent over the company's well-logging service in West Texas and New Mexico.

Part of the 148 employes of Oil Center Tool Co. attending the recent barbecue which is given annually on the site of the company's main office and factory on Airline Drive in Houston, Tex. Master of ceremonies was A. J. Penick, president of O-C-T, who also served as chief barbecue-er

CLASSIFIED ADVERTISING

Patent Attorneys

PATENTS — TRADE MARKS

All cases submitted given personal attention.

Form "Evidence of Conception" with instructions for use and "Schedule of Government and Attorney's Fees"—FREE.

LANCASTER, ALLWINE & ROMMEL
Patent Law Offices
418 Bowen Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years Experience
Inquiries Invited
B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

FOR SALE: Oil and gas leases, small production, drilling propositions, fluorspar and rock asphalt deposits. Reports and maps furnished on request. W. P. Harley, Bowling Green, Ky.

CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

FOR LEASE the NE¼ of the NE¼ of Sec. 3-34-3W, Toole County, Montana.
T. S. MILES
1004 First Natl. Bank Bldg., Omaha, Neb.

SOUTH DAKOTA BASIN: Follow the big boys. Commercial Leases, active counties. Tracts 40 acres up. 8 to 10 years to run, ten cents per acre yearly rental. Opinions of Title furnished, $100.00 per 40. Cheap speculation with merit and possibilities. Also large drilling blocks with favorable geology. Map furnished on each sale. Inquiries solicited. Dakota Oil Exploration Company, Box 436, Pierre, S. D.

MICHIGAN: — Will secure on order Leases, and Drilling Blocks, William J. Morriss—70 Highland Ave., Highland Park, Michigan—To. 8-1203.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Manufacturers' Agent

ESTABLISHED agent in California oil fields offers services to represent manufacturer for duration or longer on part time or other basis. 20 years' experience sales and executive capacities and currently contacting all principal oil industry divisions. Box B-110, The Oil and Gas Journal, Tulsa, Okla.

—ATTENTION—
MANUFACTURERS & DISTRIBUTORS

Business is quiet, yes, but it will come back. Don't pull your stocks out and neglect your customers. We have had six successful years of selling, warehousing and distributing for leading manufacturers of oil well equipment. We save you 50-75% of your overload. Our warehouses located at Odessa, Houston & Kilgore, Tex, serve all of Texas, New Mexico, Arkansas and Louisiana. 24 hours warehouse service at all points by competent men.

THE BRANDON COMPANY
BOX 1047 ODESSA, TEXAS

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

OUT OF 5000 American financial houses only 223 bought small issues last few years. The 223 names $4.00. JOHN F. MORRIS. Box 5411, Philadelphia.

Help Wanted

INDEPENDENT refiner, who is now building plant to manufacture 100 octane aviation gasoline, requires the services of a petroleum engineer who has had experience in the operation and design of Thermal and Catalytic Cracking Reforming, Gas Recovery and Alkylation plants. In replying give education, qualifications and refining experience in detail; also salary expected. TERMINAL REFINING CORPORATION, P. O. Box 1500, Corpus Christi, Texas.

ENGINEERS
DRAFTSMEN
SQUAD LEADERS
DESIGNERS

—experienced in design of power plants, concrete foundations, steel structures, pressure vessels, piping, sewers.

Oil refinery experience desirable.

Send complete details of professional experience, present salary, desired salary.

Jobs carry priority A-1-A.

40 hour week with time and one half for overtime.

J. F. PRITCHARD & CO.
528 Dwight Bldg., Kansas City, Mo.

WANTED: Man with general office or field sales experience by large reputable manufacturer of seamless and electric welded tubing, alloy and carbon steels. Please apply giving full information, experience, etc. to Box B-111 The Oil and Gas Journal, Tulsa, Okla.

CHEMICAL ENGINEERS WANTED
with any of the following experience:

1. Petroleum refinery experience in operation or design of stabilizers, absorbers and light end equipment.
2. Refinery experience in design or operation of plants for solvent dewaxing and solvent extraction of lube oils.
3. Refinery experience in design or operation Thermal or Catalytic Cracking Plants.

In reply state education qualifications and refinery experience in detail. Also salary expected and status regarding military service.

FOSTER WHEELER CORPORATION
Room 2403, 165 Broadway,
New York.

Help Wanted

DESIGNERS
AND
DRAFTSMEN

For Oil Refinery work carrying high priority ratings of A-1-A and A-1-B under

Government Defense Program

Working 56 hours 3 weeks per month and 44 hours one week with time and one-half for work in excess of 40 hours per week.

Must have experience in design of:

Oil Refinery Process Piping,
Concrete and Structural,
Oil Heating Furnaces,
Electrical Control
and
Light and Power
Conduit Systems.

Can use several piping squad leaders. Must be thoroughly experienced on piping design and layout.

ARTHUR G. McKEE & COMPANY
Engineers & Contractors
OIL REFINERIES
BLAST FURNACES
STEEL PLANTS
2300 CHESTER AVENUE
CLEVELAND, OHIO

Situations Wanted

CAPABLE REFINERY DESIGN ENGINEERS, IN ORDER TO PUSH VICTORY CONSTRUCTION PROJECTS, wish to do consulting engineering and design work in spare time. References and details of experience furnished upon request. Box B-113, The Oil and Gas Journal, Tulsa, Okla.

"MR. EXECUTIVE"
I HAVE HAD 12 YEARS EXPERIENCE Pipelining, gauging, refining and office work. Have broad knowledge, lease and royalty business. Now employed; desire to get with company with expansion future. Age 33, draft status 3-A. WILL START IN ANY CAPACITY AND MAKE YOU MONEY. Box B-131, The Oil and Gas Journal, Tulsa, Okla.

POSITION wanted by man having 25 years experience constructing and maintaining pipe lines. Can handle anything in erecting or repairing steel tanks. Experience in protecting steel tanks from air raids or shell fire. Can go anywhere. Box B-130. The Oil and Gas Journal, Tulsa, Okla.

Wanted

WANTED: Proven Oil production deals. $100,000 or more, no brokers.
M. R. TRAVIS
1702 S. Boulder. Ph. 2-2447, Tulsa, Okla.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

FOR SALE—Landowner's Royalty under 160 acres leased to Humble Oil & Ref. Co. in Lea County, N. M., 27 pools in the county. Will sell in small interests. HARRY S. WRIGHT, FARMINGTON, NEW MEXICO.

ROYALTY WANTED, SMALL BLOCKS IN KANSAS AND OKLAHOMA. PREFER BARGAINS FROM OWNERS. BOX 618, GREAT BEND, KANSAS.

WE MAINTAIN A MARKET FOR REGISTERED DEALERS IN ALL TYPES OF OIL ROYALTIES

FIRST DEPENDABLE OIL CORP.
522 Fifth Ave., New York, N. Y.

INQUIRIES invited to buy or sell producing royalties, Illinois preferable. J. A. Wolf, 407 S. Dearborn St., Chicago, Ill.

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

Equipment Wanted

WANTED
Large Steel Storage Tanks and Structural Steel Buildings.
GREENSPON'S
National Stock Yards
(St. Clair County), Ill.

WANTED
2—35,000-55,000 bbl. storage tanks.
2—1300' air compressors.
20—25 ton locomotive cranes.
R. C. STANHOPE, INC.
60 E. 42nd St., New York, N. Y

WANTED
ALL SIZES
—CASING—
—TUBING—
&
—LINE PIPE—

Will Buy IN or ABOVE GROUND
State condition, Price and Location.

BOX B-100
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

WANTED—BULK PETROLEUM STORAGE, 10,000 BBLS. TANKS OR LARGER. Box B-120, The Oil and Gas Journal, Tulsa, Oklahoma.

EQUIPMENT WANTED

WE ARE IN URGENT NEED OF THE FOLLOWING MACHINES TO FULFILL WAR CONTRACTS

We Will Buy or Lease For the Duration

1—No. 3 or No. 5 Cincinnati Universal Milling Machine or equivalent in other good type machine.
2—No. 5, No. 1L or 3L Gisholt Turret Lathes or equivalent machines in J. & L. or Warner & Swasey.

MACHINES MUST BE IN GOOD CONDITION TO HANDLE CLOSE TOLERANCE WORK

WIRE — WRITE — CALL
Stating condition, type and price of machines.

ENGINEERING LABORATORIES, Inc.
624 East Fourth Street
Tulsa, Oklahoma, U. S. A.
Telephone—2-8291 LD—766

For Sale—Equipment

FOR SALE: 1 Brauer Steam operated shale shaker, $100. Patridge, Cities Service Oil Co., Bartlesville, Okla.

#81 KEYSTONE Spudder, 65. ft. mast, all steel, Caterpillar mount complete with 4" to 10" tools.

5 x 10 Gardner-Denver Mud Pump, 80 HP International Gas-Gasoline Motor, mounted on skids. Utility & Industrial Supply Company, Jackson, Michigan.

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	1 time	$5.00
1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

PRESSURE VESSELS—PUMPS—BUBBLE TOWERS—TANKS
VALVES and FITTINGS—HEAT EXCHANGERS—COMPRESSORS

Fully Reconditioned Refinery Equipment All Kinds

Send Us Your Inquiries—No Priorities Required

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

ALL OR ANY PART—COMPLETE 2000 BARREL REFINERY

Bubble Tower 5'x52'x⅜" — 21 Trays With Caps Chrome Alloy — 2000 bbl. Pipe Still, 2½" ID x 2 15/16" OD x 20' Tubes Alloy Headers — 8 Heat Exchangers, 255 sq. ft. ea. All New Tubes — Complete Copper Sweetening Unit — New Carload Ethyl Plant — 47 Storage Tanks from 500 to 15000 bbl. cap. — 30 Pumps All Types — Valves — Fittings — Pipe

THE PLAINS OIL & REFINING CORPORATION
GREAT BEND, KANSAS

NEW—COMPLETE

2 Jensen Bros. pumping units, size 12D, cable type, 34" stroke, with Allis-Chalmers Model B-15 power units equipped with Ensign carburetors for butane-natural gas-gasoline, with controls, etc.

SONKEN-GALAMBA SUPPLY CO.
TULSA, OKLAHOMA

FOR SALE: At Bartlesville, two 40-gallon Soda and Acid "Ajax" Fire Extinguishers mounted on wood wheels. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: 27½" Ideal Rotary Table, 5 sheave 200 ton Crown Block, 4 sheave 72⅝ traveling block, 8" Ideal enclosed rotary hook. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: At Oklahoma City, 65, 70, 75 and 85 HP Oil Field Type Boilers, repaired, tested and ready to go. Also large stock of unrepaired boilers. Patridge, Cities Service Oil Company, Bartlesville, Okla.

COMPRESSOR CYLINDERS

2—18 x 20 Type S Clark
1—17 x 20 Type S Clark
1—16 x 20 V.H. Bessemer
1—15 x 20 V.H. Bessemer
1—7½ x 20 — 750# W.P. Bessemer
1—8½ x 20 Worthington
1—15 x 20 Worthington
3—16 x 20 Ingersoll-Rand

All above reconditioned and ready for work.

W. S. SMITH, 523 Thompson Bldg.
Tulsa, Okla. Phone 2-5473

FOR SALE at Wewoka: 1-10 ton Athey Trusswheel wagon, Model 843, Serial J616. $150. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: 12 K.W. Portable Light Plant powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

FOR SALE: Burrton, Kansas, dismantled 122' Parkersburg Angle Iron Rotary Derrick. Complete with safety top, bull, calf wheel girt, outside framer sills, $700. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE

COMPRESSORS

Complete Repressuring or Air Lift Plant for Immediate Delivery.

2—13 & 5½ x 12 Ingersoll-Rand XOB compressors 400# pressure V-belt driven by 120 H.P. Chicago Pneumatic 3-cylinder vertical gas engines.

2—12 & 7 x 10 Chicago Pneumatic 400# pressure vertical compressors direct connected to 120 H.P. 3-cylinder Chicago Pneumatic vertical gas engines complete.

Used very little — excellent condition. Located on original foundation in Louisiana.

EARL E. KNOX COMPANY
Erie, Penna.

NEW COUPLINGS: 500 2½" Upset Tubing 10 V and 11½ thread, 2000 line and casing, sizes ¼ to 6" inclusive. Write Daniel A. Moritz Company, McKeesport, Pa.

NEW POWER UNITS

Four Caterpillar gasoline motors, new, 75 H.P. complete with governors, master clutch, carburetor, and magneto, not mounted, suitable for power unit; $395.00 each. O. C. Evans, Mt. Sterling, Ky.

EMCO-McGAUGHY Integrator for Foxboro and Emco Recording Orifice Meter Charts, good condition. Utility & Industrial Supply Co., Jackson, Michigan.

I have sold second-hand alloyed once run Okla City Sucker rods to the largest independent oil producers in Kansas, Okla. & Texas, five producers have bought from 50 to 300,000 ft. all with good results. I am subject to call at anytime. I will dispose of the balance of ⅞", ⅞" & 1" in truck load lots delivered to your location on 60 days trial, for about half of new price. Your use subject to the approval of my engineer. Can also be used for pull rods. Six 2½" x 7" Guiberson tubing catchers and six 2½" sucker rod overshots.

MIKE TRAVIS
1702 S. Boulder Tulsa, Okla.
Phone 2-2447

FOR SALE: Star Mfg. Company, portable cooling tower, telescoping type, 7' wide, 13' long, 8' high. All steel. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: 7¼ x 14 Oil Well Power Slush Pump. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: 1 Askenia Type Magnetometer #7970, $750.00. Cities Service Oil Co., Bartlesville, Okla.—H. D. Patridge.

FOR SALE

OIL STORAGE TANKS

IN GOOD CONDITION

2—80,000 Bbl.
1—35,000 Bbl.
1—5,000 Bbl.
1—4,400 Bbl.
3—2,500 Bbl.
1—3,000 Bbl.
1—1,000 Bbl.
1— 600 Bbl.
1— 100 Bbl.
2—1,200 Bbl. Agitators (prac. new)

Address Your Inquires to

Dulien Steel Prod., Inc.
2280 Woolworth Bldg.
NEW YORK CITY, N. Y.
TELE. CORT. 7-4676

FOR SALE: 1—25 HP Westinghouse Sleeve Bearing Weatherproof type "CS" Electric Oil Well Pumping Motor, Serial #1134267; Class 3553; 3-phase; 60 cycle; 220/440 volt, 1150 R.P.M. Practically new. Box 390, Blackwell, Oklahoma.

---

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P. International Motor. Melton Supply Co. Seminole, Oklahoma.

ABSORBERS

2—72" x 30, 15 tray, 75# W.P.
1—72" x 30, 15 tray, 50# W.P.

All Southwestern Engineering Co. Make
W. S. SMITH, 523 Thompson Bldg.
Tulsa, Okla. Phone 2-5473

FOR SALE: Two 200 H.P. Electric Motors complete with grids and controls. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE
35 H.P. Superior Gas Engine and 16 foot Band Wheel Power. Condition A-1. The Geo. McGinley Supply Co., Bowling Green, Kentucky.

FOR SALE: Large quantity of Folded, Compressed Brake Lining suitable for Oil Well Machinery. Assorted widths and thickness, at very low prices. Samples and prices submitted upon request. Brake Lining Supply Co., Inc., 784 Commonwealth Ave., Boston, Mass.

7' x 30' STEEL Riveted Horizontal Storage Tanks. Also towers, vessels, etc. GILBERT PIPE & SUPPLY, Electra, Tex.

---

35 HP Superior Gas Engine with Clutch. 1st Class condition. GILBERT PIPE & SUPPLY, Electra, Tex.

DIESEL — GAS — ENGINES
Large selection—All sizes and types. Generator units, marine engines, gasoline engines, auxiliaries—boilers, steam engines, and turbo-generator sets.
Complete information on request.
A. G. SCHOONMAKER COMPANY
48 Church Street New York, N. Y.

FOR SALE—24,000' of ⅝" and 3000' of ¾" Pump Rods. One 87' MIW 157,000 lb. Derrick. One TC20B Oil Well Pump Unit, and misc. pumping equipment. All in first class condition. Dirks Brothers, Tuleta, Bee County, Texas.

FOR SALE—100 Sets—4½" O. D. National API Full Hole Tool Joints, all Refaced and in A-1 Condition. Joints all Caliper over 5½" O. D. Whitehead Supply Co., Longview, Texas.

FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

Reconditioned, Tested and Guaranteed Gate Valves for sale. Large stock, sizes 12" to 2", flanged end and screw end, various pressures.
Stock List and Prices on Request.

THE GATE VALVE SHOP
120 Tuke Box 1936
Pampa, Texas

FOR SALE: Two Model 35 Six Cylinder 10 x 12½ Two Cycle, each 240 HP constant at 400 RPM or 375 HP hoisting at full speed, Fairbanks-Morse Diesel Engines equipped with clutches and mounted on steel skids. Same overhauled thoroughly by factory mechanic and in A No. 1 condition. Can be seen at Loffland Bros. Company's Warehouse at Thompson, Texas. Price on application. DRILLERS SUPPLY OF TEXAS, P. O. Box 915, Ft. Worth, Texas.

FOR SALE: 28" Engine Bed Lathe; 24" Back Geared Drill Press; 12" to 5" Pipe Machine with new Dies; 6" to 1" Pipe Machine; general machine shop equipment, motors and tools.
OSAGE OIL FIELD SERVICE
P. O. Box 146
Hominy, Oklahoma

FOR SALE: Double Drum Drilling-in and Clean-out unit with Spudding attachment, capable to 5500 feet. A-1 condition, with 55 foot sectional sheave roller-bearing mast. Price $3000. For quick sale. Terms. Box 133, McPherson, Kansas.

HEAT EXCHANGERS & GAS COOLERS
2—170 Sq. ft. 250# W.P. Southwestern Make, 16 pass on liquid 10 pass on vapor.
2—G120 Braun Heat Exchangers
1—F155 Baun Heat Exchanger
W. S. SMITH, 523 Thompson Bldg.
Tulsa, Okla. Phone 2-5473

REFINERY EQUIPMENT
From
RODESSA REFINERY, SHREVEPORT, LA.

ALLOY CRACKING TUBES—3½" OD x 2⅝" ID x 31' 6" long. 1¼% Chrome DM. K4B HEADERS—Series 7000. 3½" OD x 6¼" Centers.

ALSO AVAILABLE FOR IMMEDIATE DELIVERY:

1—CRACKING CHAMBER—6'0" x 65' 4¼" overall, self-supporting. Head and shell thickness 1⅛". Quadruple riveted, double strap butt joints. Seams and rivets welded inside and outside.
1—VAPORIZER—6'0" x 34'0" overall, self-supporting. Head thickness 1⅛". Shell thickness 1⅝". Quadruple riveted, double strap butt joints. All seams and rivets welded inside and outside.

PUMPS, VALVES, FITTINGS, REFINERY SPECIALTIES, FRACTIONATING TOWERS, AND ABSORBERS.

WE SOLICIT YOUR INQUIRIES FOR ALL REFINERY EQUIPMENT

BROWN-STRAUSS CORPORATION

At (Cedar Grove) Shreveport, La.
Phone 7-7334
Morton I. Glass, Resident Engineer

Main Office: Kansas City, Mo.
LD. Phone 188
Harry B. Strauss, Manager

BUY AND SELL

Used Engines, Compressors, Power Plants and Gasoline Plant Equipment.

We Rebuild and Guarantee

L. F. SMITH CO.

217 W. Archer, Tulsa, Okla.

Journalisms:

A NEW word is being added to the vocabulary of the oil industry. The word is petro-chemistry, and you'll be hearing a lot more about it in the months to come. The infant petro-chemical industry is growing so fast that it would be premature at this time to attempt a definition of its full meaning, or a delineation of its scope. It goes far beyond the cracking and reforming arts, and embodies all the steps involved in transforming petroleum stocks by chemical reactions into a number of useful byproducts. These evolutions in refining synthesis, and petro-chemistry, are a logical outcome of the research and development work which the industry has carried on for several years to which the war has given additional impetus.

Production of toluene, high-octane fuels, butadiene, solvents, alcohols, acids, and pharmaceutical products comprise the principal developments to date, but the possibilities and economic justification for further expansion appear to be unlimited. The Journal's annual Gulf Coast Issue of June 25 will give you an introduction to the subject, featuring developments in that area, and we promise to keep you informed of the progress in the subject as the nation's chemists and plant operators delve deeper and deeper into this new and absorbing exploratory realm.

•

DESPITE widespread national-defense activities in the oil industry in 1941, and notwithstanding numerous changes in employment and many new employes, the industry's safety record maintained its status, severity remaining unchanged during the year, while frequency increased only 1.6 per cent. The record was compiled from the reports of 172 companies, employing 333,122 persons, who worked nearly 700,000,000 hours in 1941. It is believed that this record is substantially better than the average of all industries last year. For the past 10 years the petroleum-industry record has been below, or close to, the all-industry average. Since 1929 the frequency rate for all branches of the industry has declined more than 60 per cent.

•

ONE of our readers, with waggish spirit and tongue in cheek, writes in to suggest that a method be devised whereby oil wells in areas about to be invaded by the enemy would be equipped so they could be turned wrong side out and converted into tank traps. No doubt they would later be put back on production by drilling them from the bottom up.

•

GEOLOGICAL maps are of many kinds; they may show the distributions of formations outcropping at the surface, another type of map shows subsurface geology on planes at different levels. A very valuable type of map shows the distribution of formations below an unconformity. The Journal is presenting a still different variety in its Gulf Coast Number. On this map, the greatest depth drilled on producing structures is considered as an irregular surface. The formations found on this surface are plotted. Local peaks, showing structures which have not been drilled to great depths lie in close proximity to others which have found production a considerable distance down. The most descriptive name yet applied is "A geological map of the top of the unknown." That could have been applied to the surface maps of 1901. The oil industry has pushed the top of the unknown quite a distance into the earth. The irregularity of the surface suggests that many structures have important reserves a short distance below present production.

•

IF all the holes American oil-drilling crews drilled during 1941 were laid perpendicularly end to end, the hole would be deep enough for a round trip straight through the earth to China with a good 2,000 miles to spare. So estimates someone at the American Petroleum Institute, who likes to put things end to end for the sake of impressive statistics. The total mileage drilled was in excess of 18,000. Which is a goodly amount of hole.

CALENDAR

June

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, semiannual meeting, Cleveland, Ohio, June 8-11.

AMERICAN SOCIETY OF TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26.

September

NATIONAL PETROLEUM ASSOCIATION, annual meeting, Hotel Traymore, Atlantic City, N. J., September 16-18.

October

NATIONAL SAFETY CONGRESS AND EXPOSITION, Stevens Hotel, Chicago, October 5-9.

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, twenty-third annual meeting, Dallas, Tex., October 8-10.

NATIONAL STRIPPER WELL ASSOCIATION, annual convention, Wichita, Kans., October 19.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, fall meeting, Hotel Severin, Indianapolis, Ind., October 14-15.

NATIONAL STRIPPER WELL ASSOCIATION, annual meeting, Wichita, Kans., October 19.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, thirteenth annual convention, Wichita, Kans., October 20-22.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

ILLINOIS MINERAL INDUSTRIES CONFERENCE, Campus, University of Illinois, Urbana, Ill., October 30-31.

November

AMERICAN PETROLEUM INSTITUTE, twenty third annual meeting, Stevens Hotel, Chicago, Ill., November 9-13.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, thirty-fifth annual meeting, Netherlands Plaza Hotel, Cincinnati, Ohio, November 16-18.

AMERICAN CHEMICAL SOCIETY, national chemical exposition and national industrial chemical conference, Stevens Hotel, Chicago, Ill., November 17-21.

NATIONAL CHEMICAL EXPOSITION AND NATIONAL INDUSTRIAL CHEMICAL CONFERENCE, annual meeting, Stevens Hotel, Chicago, Ill., November 17-22.

December

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York, November 30-December 4.

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA, Hotel Mayo, Tulsa, December 17.

ADVERTISERS IN THIS ISSUE

Abercrombie Pump Co.	84
American Bosch Corporation	73
Armstrong Machine Works	87
Bucyrus-Erie	7
Chaplin-Fulton Mfg. Co., Inc.	81
Chapman Valve Mfg. Co., The	5
Chipman Chemical Co.	61
Classified Advertising	94-95
Continental Supply Company, The	71
Dehydro Company, The	62
Dowell Incorporated	10
Fibre & Metal Products, Inc.	96
Fisher Governor Company	67
Fluor Corporation, Ltd., The	47
France Mfg. Co.	75
Franks Mfg. Co.	87
Gatke Corporation	87
General American Transportation Corporation—Terminal Division	69
General American Transportation Corporation—Plate & Welding Division	83
Girdler Corporation, The	50
Gott, H. P., Mfg. Co.	79
Hanlon-Buchanan, Inc.	Front Cover
Hughes Tool Co.	Back Cover
Johns-Manville Corporation	84
Kobe, Incorporated	12
Lane-Wells Company	Inside Front Cover
Lucey Products Corp.	80
Lufkin Rule Co.	57
Lummus Co., The	48A-48B
McCord Radiator & Mfg. Co.	87
McEvoy Company	79
McGregor Working Barrel Company	85
Page Fence Association	82
Penberthy Injector Co.	43
Petroleum Electric Power Association	60
Pittsburgh-Des Moines Steel Company	78
Plomb Tool Co.	86
Powell, Wm., Co., The	3
Republic Steel Corporation	9
Ross, J. K.	83
Scybolt & Co., E. W.	61
Southern Mill & Mfg. Co.	55
Spicer Mfg. Co.	52
Templeton, Kenly & Co.	86
Texaco Development Corporation	4
Thornhill-Craver Co.	61
Timken Roller Bearing Company	6
Union Wire Rope Corporation	76
Universal Oil Products Co.	45
Votator Division, The Girdler Corp.	2
Wall-Colmonoy Corp.	57
Walworth Co.	1
Wheatley Bros. Pump & Valve Mfrs.	58-59
Young Radiator Co.	82
Youngstown Sheet & Tube Co.	Inside Back Cover
Zink, John, Co.	77